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The Sloan Canyon National Conservation Area

Record of Decision
for the
Approved Resource Management Plan/ Final Environmental Impact Statement and Approval of the North McCullough Wilderness Management Plan



BLM

Las Vegas Field Office / Nevada

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Las Vegas Field Office
4701 N. Torrey Pines Drive
Las Vegas, Nevada 89130-2301

TAKE PRIDE IN AMERICA

In reply refer to: 1610-5.G.1.4

June 2006

Dear Reader:

The Bureau of Land Management (BLM) is pleased to present the Record of Decision (ROD) for the Approved Resource Management Plan (RMP) for the Sloan Canyon National Conservation Area (NCA) and the approved North McCullough Wilderness Management Plan. This RMP provides a framework for the future management direction and appropriate use of the NCA and the North McCullough Wilderness located in Clark County, Nevada.

The RMP is the result of an extensive collaboration effort among State, tribal, and local governments, other federal agencies, organizations, and members of the public. The ROD contains both land use planning decisions and implementing decisions to provide planning structure to facilitate the management of the Sloan Canyon NCA.

A 30-day protest period was provided on the land use plan decisions contained in the Proposed RMP/ FEIS in accordance with 43 CFR 1610.5-2. BLM received four protest letters. After careful consideration of all points raised in those protests, the BLM Director concluded that the responsible planning team and decision makers followed all applicable laws, regulations, policies, and pertinent resource considerations in developing the proposed plan. In addition, the Governor of Nevada was provided a formal 60-day review period to determine if the proposed plan conformed to existing state plans. No inconsistencies with State or local plans, policies, or programs were identified during the Governor's consistency review of the Proposed RMP/FEIS. As a result of these reviews, only minor editorial modifications were made in preparing the ROD.

The ROD is the final decision for the land use plan decisions described in the RMP and becomes effective on the date the ROD is signed. Any substantial change to the RMP can only be made through a plan amendment process with full public involvement and notification, in accordance with BLM regulations 43 CFR 1610.5-5.

Public involvement with the management of the Sloan Canyon NCA does not end with the RMP. Beginning immediately and in the coming years, more specific plans to implement the decisions

of the RMP, such as the trails plan and interpretive plan, will be prepared and public involvement in that planning will be welcomed.

If you would like more information, please send your requests to Bureau of Land Management, Las Vegas Field Office, 4701 North Torrey Pines Drive, Las Vegas, NV 89130-2301.

Sincerely,

Ron Wenker

Ron Wenker, Nevada State Director
Bureau of Land Management

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SLOAN CANYON
NATIONAL CONSERVATION AREA

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Las Vegas Field Office
Las Vegas, Nevada

May 2006

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Prepared by
U.S. Department of Interior
Bureau of Land Management
Las Vegas Field Office

Cooperating Agencies:
Nevada Department of Wildlife (NDOW)
Nevada State Historic Preservation Office (SHPO)
Clark County Department of Comprehensive Planning
City of Henderson
Boulder City
Las Vegas Paiute Tribe
Paiute Indian Tribe of Utah
Fort Mojave Indian Tribe

Juan Palma 5/25/06
Juan Palma Date
Recommended
Bureau of Land Management
Field Manager, Las Vegas Field Office

Ron Wenker 5/30/06
Ron Wenker Date
Approved
Bureau of Land Management
State Director, Nevada

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RECORD OF DECISION

1.0 RECORD OF DECISION

The decision is hereby made to approve the proposed Resource Management Plan (RMP) for the Sloan Canyon National Conservation Area (NCA) and select Alternative C as presented in the Final Environmental Impact Statement. The decision is also made to approve the North McCullough Wilderness Plan, attached, and as presented in Appendix C of the Proposed RMP. Both management plans were prepared under the regulations implementing the Federal Land Policy and Management Act of 1976 (43 CFR 1600), the Clark County Conservation of Public Land and Natural Resources Act of 2002, and other regulations, as appropriate (Appendix A). An environmental impact statement (EIS) was prepared for both plans in compliance with the National Environmental Policy Act (NEPA) of 1969. The plans are nearly identical to the ones set forth in the *Sloan Canyon National Conservation Area Proposed RMP and Final Environmental Impact Statement* published in October 2005. Both general and specific management decisions for the Sloan Canyon NCA are included in this Record of Decision (ROD).

1.1 ALTERNATIVES CONSIDERED

Four alternatives were analyzed in the Draft RMP/EIS. Public input received throughout the planning process drove development of the alternatives. The goal was to construct a range of management actions and tools to balance the predicted increase in use of the NCA with protection of the NCA's outstanding characteristics, such as its primitive character and cultural resources. Alternatives had to meet the purpose and need of the NCA management plan, be viable and reasonable, provide a mix of resource protections, management use, and development, be responsive to issues identified during scoping, and meet the established planning criteria, federal laws, regulations, and BLM planning policy.

The No Action Alternative would have continued existing management conditions under the Proposed *Las Vegas Resource Management Plan and Final Environmental Impact Statement*, the Sloan Canyon NCA Act and Clark County Act, Title II ("Wilderness Areas"), all existing laws, regulations, and policy, and the Wilderness Act of 1964. Alternative B was the environmentally preferred alternative and emphasized the natural character of the NCA and represented the most restrictive management approach while being the most resource-protective. Alternative C (the Preferred Alternative) focused on a moderate increase in development while maintaining the natural characteristics of the NCA. Alternative D presented the most active management approach, allowing maximum use while maintaining and enhancing resource conditions.

1.2 MANAGEMENT CONSIDERATION FOR SELECTION OF THE RMP

Both the Approved RMP and the Wilderness Management Plan were selected because they best serve the purpose of the NCA as described by the enacting legislation and the NCA vision as developed by the interagency planning team. On the basis of public comments received on the Draft RMP/EIS and discussions with the cooperating agencies, some elements of Alternatives B and D were integrated into Alternative C before publishing the Proposed RMP/FEIS. Thus, the approval of the proposed RMP Alternative C represents carefully selected elements from all of the action alternatives developed through a dynamic public process. The Approved RMP provides for moderate levels of developed recreation, facilities, and transportation with management actions to ensure that neither resources nor visitor experiences are unacceptably degraded. Alternatives B of the Final EIS is the environmentally preferred alternative.

The Sloan Canyon NCA Act directs BLM to grant the City of Henderson a right-of-way (ROW) for the North McCullough Road (N-65874), which is envisioned as a scenic roadway that would be constructed to provide access to the NCA, trailheads, and overlook points. The Act requires BLM to recommend a location for the North McCullough Road as part of the planning process. Based on ground surveys, field visits, impact assessments, and extensive dialogue with City of Henderson planners and engineers, as well as cooperating agencies, BLM recommends the proposed Northern Corridor as the location for North McCullough Road. Any future development related to this scenic roadway or associated trail will require additional environmental review.

1.3 MITIGATION MEASURES

Mitigation measures are incorporated into the approved RMP and Wilderness decisions. Sensitive resources are protected through resource allocations, recreation use management, and limitations and restrictions on developments and other activities. All practicable means to avoid or minimize environmental harm are carried forth in the Approved RMP. During implementation and, in some cases, the next tier of planning, additional measures may be taken, as necessary, to mitigate potential impacts on the environment. Monitoring will determine how effective these measures are in minimizing environmental impacts.

1.4 PLAN MONITORING

BLM will monitor the plan at a minimum of five-year intervals to ensure that decisions are effectively implemented, and to evaluate indicators of change identified in the various natural resource and program decisions. During the life of the approved plan, BLM expects that new information gathered from field inventories and assessments, research, other agency studies, and other sources will update baseline data or support new management techniques and scientific principles. To the extent that such new information or actions address issues covered in the Approved RMP, BLM will integrate the data through a process called plan maintenance or updating. As part of this process, BLM will periodically review management actions and the Approved RMP to determine whether the objectives in this and other applicable planning documents are being met. Where they are not being met, BLM will consider adjustments of appropriate scope. Where BLM considers taking or approving actions that would alter or not conform to the overall direction of the Approved RMP, BLM will prepare a plan amendment and an environmental analysis of appropriate scope, and seek additional public comment.

1.5 PUBLIC INVOLVEMENT

1.5.1 SCOPING

Four public scoping meetings and three tribal information meetings were held in November and early December 2003 (Table 1.1). A total of 125 individuals attended the public scoping meetings that took place in an "open house" format, which provided attendees the opportunity to interact with and direct comments and concerns to BLM resource specialists.

Table 1.1 Public Scoping and Tribal Information Meetings

Date	Location	Meeting Type
November 13, 2003	Las Vegas, Nevada	Tribal Information
November 17, 2003	Henderson, Nevada	Public Scoping
November 18, 2003	North Las Vegas, Nevada	Public Scoping
November 19, 2003	Boulder City, Nevada	Public Scoping
November 20, 2003	Las Vegas (Summerlin), Nevada	Public Scoping
December 11, 2003	Parker, Arizona	Tribal Information
December 15, 2003	Sloan Canyon NCA	Tribal Information

A total of 512 comments were received during the scoping comment period. The comments confirmed that the public, tribes, and agencies understood and embraced the concept of making recommendations for management of the NCA. The comments provided many well-considered ideas, along with identifying related issues, concerns, and potential impacts. A majority of the comments addressed recreation, access and transportation, and cultural resources, with widespread agreement that the Sloan Canyon Petroglyph Site should be protected. Cultural resources comments and issues advocated protection of such resources from impact of visitation, vandalism, and theft. Some Native Americans requested permission to conduct tribal ceremonies at the NCA. Recreation comments and issues ranged from hiking trails and mountain biking to camping and recreational target shooting. All issues and concerns submitted during the scoping period have been considered in the development of the Approved RMP.

1.5.2 DRAFT RMP/EIS

A 90-day comment period on the Draft RMP/EIS was initiated with the publication of the Notice of Availability in the *Federal Register* on March 25, 2005 (*Federal Register*, Volume 70, Number 57, March 25, 2005, Page 15347-15348). Copies of the Draft RMP/EIS were mailed to interested agencies, tribes, individuals, and organizations. The document was also posted on the BLM webpage (http://www.blm.gov). Two public meetings were held during the 90-day public comment period on the Draft RMP/EIS. A total of 131 comment letters containing roughly 549 comments were received from federal and State agencies, tribal and local governments, conservation or environmental organizations, commercial interests groups, and other interested members of the public. The comments, commenters' names, and BLM responses can be found in Appendix J of the Proposed RMP/FEIS.

1.5.3 PROPOSED RMP/FINAL EIS

A 30-day protest period, which began on October 14, 2005 and ended on November 13, 2005, was provided on the land use plan decisions contained in the Proposed RMP/FEIS in accordance with 43 CFR 1610.5-2 (*Federal Register*, Volume 70, Number 198, October 14, 2005, Page 60103-60105). BLM received four protest letters. After careful consideration of all points raised in those protests, the BLM Director concluded that the responsible planning team and decisionmakers followed all applicable laws, regulations, policies, and pertinent resource considerations in developing the proposed plan.

1.5.4 Cooperating Agencies

Below is a list of agencies, tribes, and organizations that participated in the development of the Approved RMP as cooperating agencies. Cooperating agencies joined BLM early in the planning process and actively participated in the planning meetings.

State of Nevada

Nevada Department of Wildlifc (NDOW)
Nevada State Historic Preservation Office (SHPO)

County

Clark County Department of Comprehensive Planning

Local

City of Henderson
Boulder City

Native American Tribes

Las Vegas Paiute Tribe
Paiute Indian Tribe of Utah
Fort Mojave Indian Tribe

Initially, cooperating agencies were asked by BLM to provide existing data and other relevant information within the scope of their responsibilities, goals, and mandates, and were encouraged to work with BLM as interdisciplinary team members to develop and assess alternatives and impacts. The BLM Las Vegas Field Office and the cooperating agencies conducted a series of meetings from January through August 2004 to develop and review management alternatives and impacts. The cooperating agencies then reviewed and commented on the Draft RMP/EIS before its publication, and afterward during the 90-day public comment period. They participated in the development of the Proposed RMP by attending meetings and reviewing the document before its publication.

Many of the cooperating agencies became integral members of the interdisciplinary team for the RMP/EIS and attended extensive meetings to share their expertise with BLM and contractor staff, making the RMP/EIS truly a cooperative effort. The City of Henderson, which shares a border with roughly the north half of the NCA, made major contributions in providing its expertise to the planning effort. The City of Henderson is also taking the NCA and its resources into account in its own city planning of streets, libraries, and other infrastructure in the rapidly developing lands bordering the NCA.

1.5.5 CONSULTATION WITH U.S. FISH AND WILDLIFE SERVICE

Early in the planning process, BLM initiated consultation with the U.S. Fish and Wildlife Service (USFWS) regarding the potential impacts of actions proposed in the RMP on federally listed species or species proposed for listing. This consultation was consistent with the procedures included in the memorandum of agreement between BLM and the USFWS completed in September 2000. USFWS provided BLM with lists of federally listed species, species that are candidates for listing, and other species of concern that could occur in the planning area. Species that are known to occur in the planning area were addressed in the planning process. Formal consultation with the Las Vegas office of USFWS concerning the potential impacts of implementing the Proposed RMP on one species, desert tortoise, was initiated on September 20, 2005. USFWS provided its Biological Opinion on the proposed plan on April 20, 2006 (Appendix I). The Biological Opinion concluded that implementation of the RMP will not jeopardize the continued existence of any affected species.

1.5.6 Consultation with Nevada State Historic Preservation Office

The BLM cultural resource management program operates in accordance with 36 CFR, Part 60, which outlines specific procedures for consultation between BLM and the Nevada SHPO. A National Programmatic Agreement among the Nevada SHPO, the Advisory Council on Historic Preservation, and BLM, which became effective in 1997, incorporates statewide protocol between BLM and Nevada SHPO, established reporting standards, and defined undertakings and activities that require consultation. The Nevada SHPO was a cooperating agency and worked with BLM throughout the planning process to ensure that historic properties were appropriately considered in the Approved RMP. Consultation with the Nevada SHPO under the Nevada State Protocol and subsequent agreements will continue.

1.5.7 Native American Tribes

The Sloan Canyon NCA is known to contain one site of major interest to Native American tribes—the Sloan Canyon Petroglyph Site; however, when the RMP was initiated, it was unknown if other sites might exist. An intensive program to identify interested tribes and include them in the identification and evaluation of cultural resources was an integral part of the planning process. Along with the provisions of NEPA and FLPMA, which are routinely implemented through tribal consultations in federal planning, the American Indian Religious Freedom Act (AIRFA) plays a special role when BLM is planning policies, which could directly or indirectly affect the management of a Traditional Cultural Property such as the Sloan Canyon Petroglyph Site. AIRFA's core mandate is to ensure that federal agencies do not inadvertently infringe upon the practice of traditional Native American religion.

Consultation with the tribes therefore occurred and continues on several different levels. Government-to-government consultations invited interested tribes to become cooperating agencies at the level of involvement of their choice, public information meetings were held at tribal locations, and an intensive ethnographic study was undertaken with the cooperation of tribal officials and individual members to identify and evaluate the cultural resources of the NCA. BLM is committed to continuing long-term consultation and cooperation with the tribes regarding the management of cultural aspects of the NCA. A Native American Coordinator has been assigned to the NCA staff to carry forward the relationships developed during the planning process. The BLM Native American Coordinator facilitated meetings with the tribes to provide updates on the Draft RMP/EIS and to develop a comprehensive Interpretive Plan.

The following Native American tribes were invited to participate in the planning process as cooperating agencies and to regularly receive planning updates:

Native American Tribes

- Chemehuevi Indian Tribes
- Colorado River Indians
- Fort Mojave Indian Tribe
- Hopi Tribal Council
- Hualapai Tribal Council
- Kaibab Paiute Tribe
- Las Vegas Paiute Tribe
- Moapa Paiute Tribe
- Pahrump Paiute Tribe

- Paiute Indian Tribe of Utah:
  - Indian Peaks Band
  - Kanosh Band
  - Koosharem Band
  - Shivwits Band
- Twenty-Nine Palms Band of Mission Indians.

1.5.8 Consistency Review

This plan is consistent with plans and policies of DOI and BLM, other federal agencies, tribal governments, State government, and local governments to the extent that the guidance and local plans are also consistent with the purposes, policies, and programs of federal law and regulation applicable to public lands. No formal comments were received from federal or tribal governments indicating the proposed plan was inconsistent with other existing plans or policies. The Governor of the State of Nevada in his letter dated February 10, 2006, identified no potential inconsistencies from with the Proposed RMP.

1.6 Public Involvement Opportunities in Plan Implementation

Public involvement with the management of the Sloan Canyon NCA does not end with the approval of the RMP. Beginning immediately and in the coming years, additional plans to implement the decisions of the RMP, such as a rails plan and interpretive plan, will be prepared and public involvement in that planning will be welcomed.

1.7 Management Plan Implementation

The Sloan Canyon NCA will develop an implementation strategy and business plan that will schedule and prioritize the implementation of decisions of the Approved RMP.

Native American tribes, the Nevada SHPO and USFWS will continue to be consulted during plan implementation for all actions that may affect, respectively, interests of Native Americans, cultural resources, or Special Status Species. Cultural resource surveys, sensitive species surveys, and other resource considerations such as Desert Bighorn Sheep lambing areas and seasons stipulated in decisions throughout the Approved RMP will be conducted prior to any surface-disturbing activity.

1.8 Plan Evolution

As part of the planning process, resource-specific plans and strategies were developed. These plans, some of which are required by regulations or the Sloan Canyon NCA Act, contain additional management guidance for on-the-ground activities, as well as timeframe and priorities for implementing the management decisions. For example, the North McCullough Wilderness Management Plan provides direction for the management of various resources and activities within the North McCullough Wilderness to ensure the preservation of the area's wilderness character.

Recreation Monitoring Plan (Appendix B)—Contains the monitoring approach that will be used in the NCA to ensure that management actions meet the recreation management goals and objectives described in the Approved RMP.

Cultural Resources Management Plan (Appendix C)—Provides key elements for the management of cultural resources during the first stage of NCA implementation.

Interpretive Strategy and Environmental Education Strategy (Appendix D)—Clarifies and sets direction for the Interpretive and Environmental Education Program at the NCA.

Litter Cleanup Plan and Public Lands Awareness Campaign (Appendix E)—Provides cleanup actions and management priorities to help ensure that an effective anti-litter message is delivered and to eventually result in a litter-free NCA.

Vegetation Restoration Strategy (Appendix F)—Developed to improve vegetation community conditions in the NCA through the restoration of existing disturbances and the management and control of future disturbances.

Biological Management Strategy (Appendix G)—Contains a general management strategy to help maintain the ecological integrity and biodiversity of the NCA.

APPROVED RESOURCE MANAGEMENT PLAN

Final Environmental Impact Statement

APPROVED RESOURCE MANAGEMENT PLAN

Final Environmental Impact Statement

2.0 APPROVED RESOURCE MANAGEMENT PLAN

In November 2002, Congress designated the Sloan Canyon National Conservation Area (NCA) to preserve and protect a portion of southern Nevada's Mojave Desert as a permanent asset for future generations. The Clark County Conservation of Public Land and Natural Resources Act of 2002 (the Clark County Act) established the Sloan Canyon NCA and the North McCullough Wilderness, which is entirely contained within the NCA (Figure 1.1). The 48,438-acre NCA, which forms the natural, mountainous southern skyline of the City of Henderson and Las Vegas, contains unique scenic and important archaeological sites. The centerpiece of the NCA is the Sloan Canyon Petroglyph Site, one of the most significant cultural resources in southern Nevada. More than 300 rock art panels with nearly 1,700 designs represent native cultures dating from the Archaic to historic era. Eventually, residential housing, schools, parks, and businesses will border much of the northern and western edges of the NCA.

Title VI of the Clark County Act (the Sloan Canyon NCA Act, Appendix A), required BLM to develop a plan for the appropriate use and management of the NCA and Wilderness within 3 years of enactment. This record of decision is the culmination of nearly 3 years of intense, systematic work by BLM, cooperating agencies, stakeholders and the public to develop an approach for managing the NCA. The approach incorporates the vision of the NCA, which is to protect its valuable resources while allowing as wide a range of activities as reasonable. The Approved RMP provides guidance for planning and management actions for the NCA for next 15 to 20 years.

2.1 CORRECTIONS TO THE PROPOSED RMP

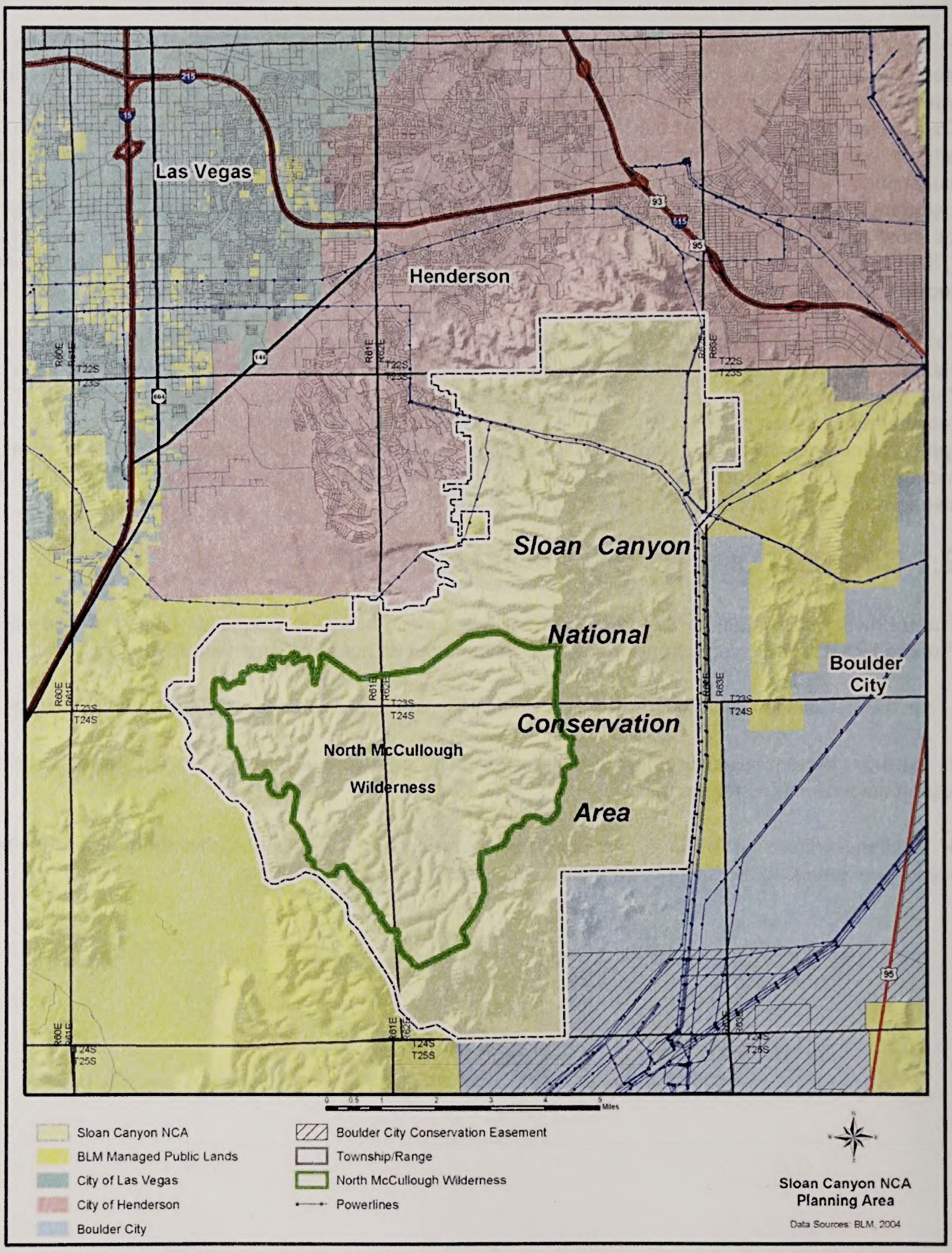
The following corrections to the proposed RMP were made based on comments BLM received on the Proposed RMP. These corrections provide clarification but do not affect approved RMP decisions.

1. pg. 3-23: Change "Foothill" to "Mission" on the discussion of where the northern alignment begins.

2. pg 4-3: Bottom sentence; remove the word trail from "road and trail." The Act did not require a recommended location for the trail.

3. Wilderness Decision WLD 4, was modified to reflect BLM's intention that multiple guides may accompany groups to the Sloan Petroglyph Management Area, as appropriate.

Figure 1.1. Sloan Canyon NCA Planning Area



2.2 MANAGEMENT DECISIONS

Management direction for lands within the NCA is discussed below, in the accompanying North McCullough Wilderness Management Plan, and in the attached appendices.

2.2.1 Management Emphasis Areas

Management emphasis areas (MEA) provide a framework for identifying BLM's management intent for a particular geographic area and for evaluating future actions and proposals. By assigning appropriate MEA categories to all portions of the NCA, future actions can be considered that have not been specifically addressed in this plan. This management approach will help ensure that the Approved RMP remains flexible and current over time.

Management Direction

The MEAs reflect the potential for increased development at the main access points for the NCA. The north access to Sloan Canyon around the potential visitor center is zoned as Developed, and the highly visited Petroglyph Management Area is a Semi-Primitive zone. In addition, the area north of the North McCullough Road and Trail ROW (N-65874) near the Dutchman Pass Trailhead is zoned Roaded Natural, as will the area south of the Quo Vadis Trailhead.

MEA 1: Manage use of the NCA consistent with the objectives of the MEAs identified in Figure 2.1.

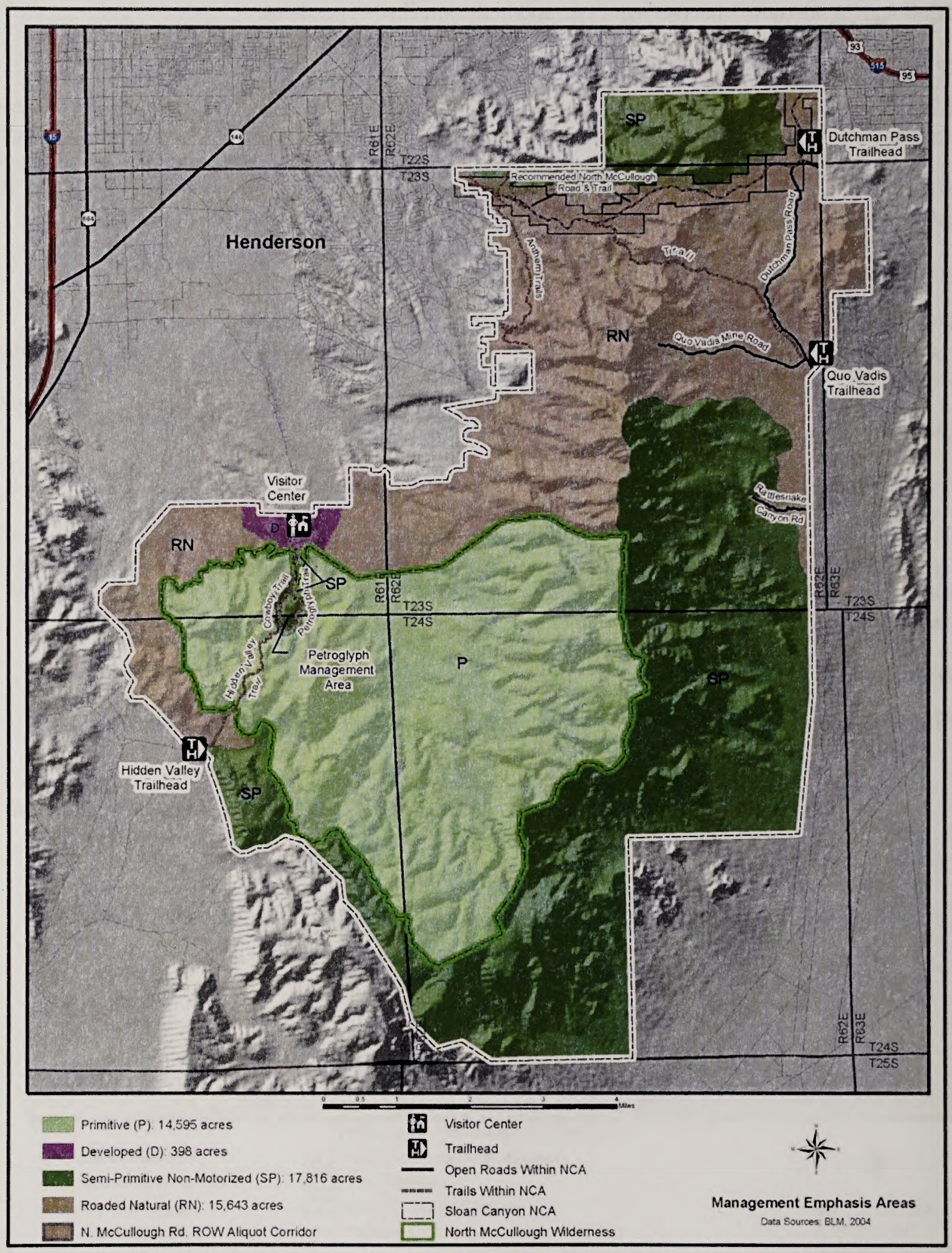
Each MEA zone has a set of objectives that describe the physical, social, and managerial setting of the area and that provide standards for future management. To provide for a positive visitor experience, any future actions or improvements within a zone must be consistent with the established guidelines and expectations.

Objectives

Primitive

- Includes remote areas not on primary travel routes or easily accessed.
- Access is by hiking and horseback; no mechanized vehicles (including mountain bikes) are allowed.
- Human interaction is rare to low; evidence of other uses is minimal.
- No onsite controls or improvements provided except those required for resource protection.
- More visitor risk is assumed; self-reliance is necessary.

Figure 2.1. Management Emphasis Areas



Semi-Primitive; Non-Motorized

- Areas might not necessarily be remote and access might be easy, but human interaction is low.
- Motorized use is prohibited; existing roads may be closed and could be converted to trails.
- Opportunities provided could include mountain bike, equestrian, and hiking trails.
- Offsite controls are preferred.
- Construction of facilities will be avoided except where they provide resource protection or aid in visitor safety.

Roaded Natural

- The recreational experience is based on the natural setting.
- Human interaction is low to moderate, but more often on the low side.
- Includes areas with roads.
- Developments limited to improved access and those consistent with the natural environment.
- Opportunities provided may include roads, trails, and camping sites (new improvements for resource protection only).
- Onsite controls present but subtle.

Developed

- Natural environment is substantially modified.
- Human interaction level is moderate to high.
- Motorized use and parking are available.
- Onsite controls obvious and facilities are widely available.
- Law enforcement is moderately visible.

2.2.2 Recreation

Goal

Provide recreation opportunities within the NCA, including the North McCullough Wilderness, consistent with the Sloan Canyon NCA Act and the Clark County Act, Title II ("Wilderness Areas").

Objectives

- Provide an array of outdoor recreation opportunities and experiences within the NCA.
- Manage recreation uses so that recreation-related disturbances are minimized.

Management Direction

Recreational use of the NCA historically has been at low to moderate levels, and future actions by both BLM and the surrounding communities contribute to the kinds of recreational opportunities available in the NCA. To be flexible and responsive to increased user demands, recreation will be managed for experiences and beneficial outcomes based on the MEA zone objectives described in Section 2.2.1. The character of the management zones ranges from Primitive to Developed in terms of their physical, social,

and administrative attributes, and these attributes define the character of the respective recreation opportunities (e.g., activities available).

Because use of the NCA will likely change dramatically over the coming years, the Approved RMP contains flexible management guidance, which will be refined into specific management criteria based on use and resource monitoring. Visitation and resource monitoring will be used to assess and establish the NCA's baseline resource conditions and document any changes to them (Appendix B, Recreation Monitoring Plan). Once the resource baselines are determined, a system such as Limits of Acceptable Change (LAC) will be used to establish thresholds for future actions.

REC 1: Use fees may be charged in designated areas of the NCA. Specific fee guidelines and amounts will be determined at a later time, consistent with nearby State and federal facilities.

REC 2: Interpretive information and materials pertaining to the NCA's unique cultural and natural resources will be provided to visitors to enhance their recreational experiences.

Hiking/Equestrian Use/Mountain Biking Areas

Based on likely amounts of use and in an effort to preserve visual and biological resources, the subsequent need for administrative controls, and the reduction of conflicts among users, the NCA will designate use areas for hiking, equestrian use, and mountain biking.

Cross-country hiking is allowed in trail-use-only areas until BLM trails are established and in use, after which some or all of these areas may be restricted to hiking on designated trails. Additional trails will be planned, designed, and constructed through a systematic process that will evaluate needs, potential uses, suitable destinations, and public interest, through an environmental assessment. Under the approved plan, a hiking trail system with a wide range of uses is anticipated. Hiking trails will not be limited to the two ROWs for hiking trails that were previously issued to the City of Henderson as prescribed by the Sloan Canyon Act (one is included in the ROW for the North McCullough Road).

REC 3: Designate hiking use areas: an area in which hiking will be limited to trails once they have been designated, constructed, and in use; and the another for cross-country hiking (Figure 2.2).

REC 4: In some areas, horses and pack animals are required to remain on designated trails once trails are designated, constructed, and in use. Cross-country equestrian use is allowed in other areas and horses and pack animals are prohibited in high-use portions of the NCA (Figure 2.3).

REC 5: No animal, other than a horse, burro, or mule, may be used in the NCA for the purpose of transporting people or their possessions.

REC 6: Horse feed and hay must be certified weed-free to prevent the spread of noxious and invasive weeds.

REC 7: Watering of animals is prohibited at wildlife water developments, and animal waste must be removed from trailheads.

REC 8: Mountain biking is allowed only on a limited system of designated multiple-use trails and on designated vehicle roads (Figure 2.4).

Figure 2.2. Hiking

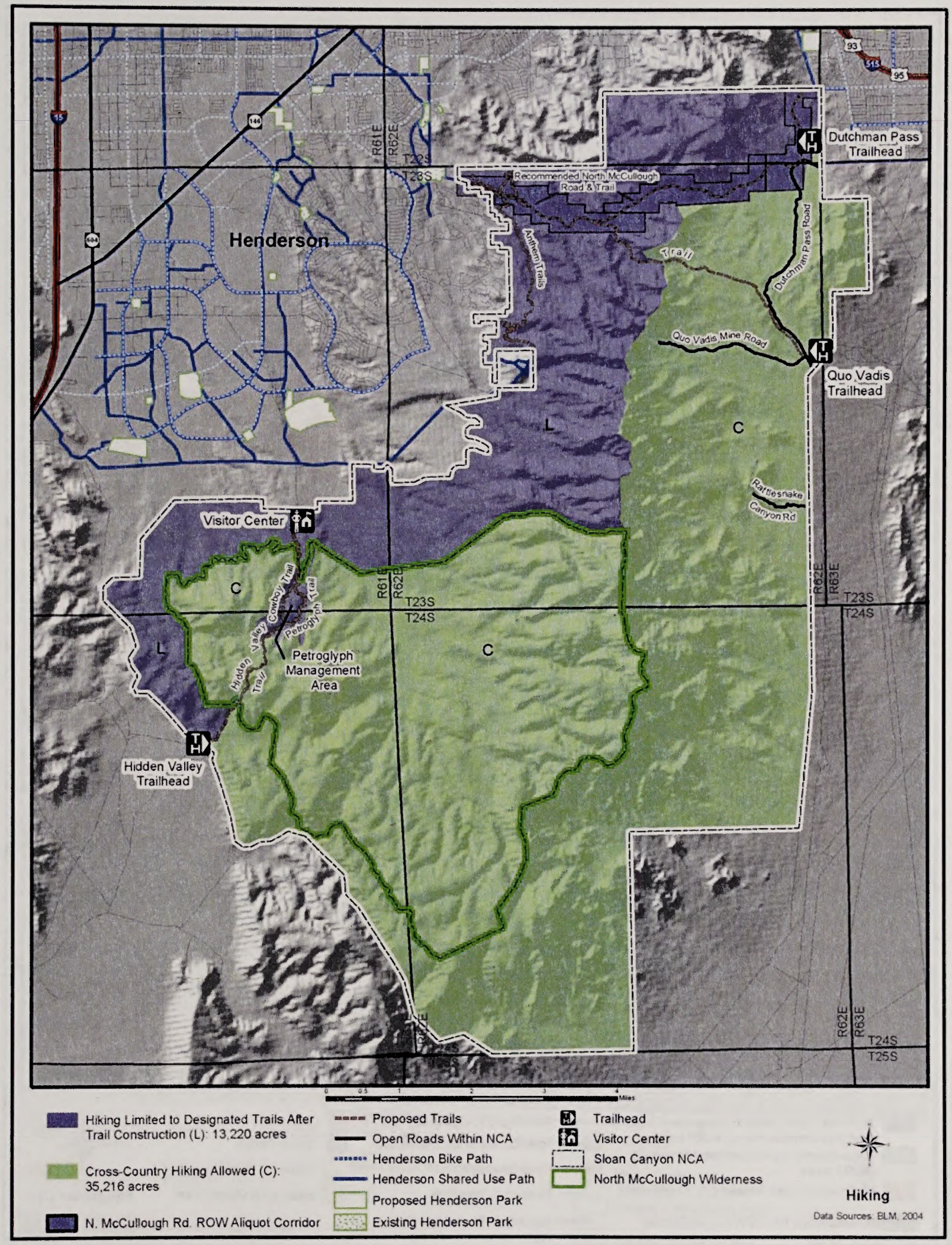


Figure 2.3. Equestrian Use

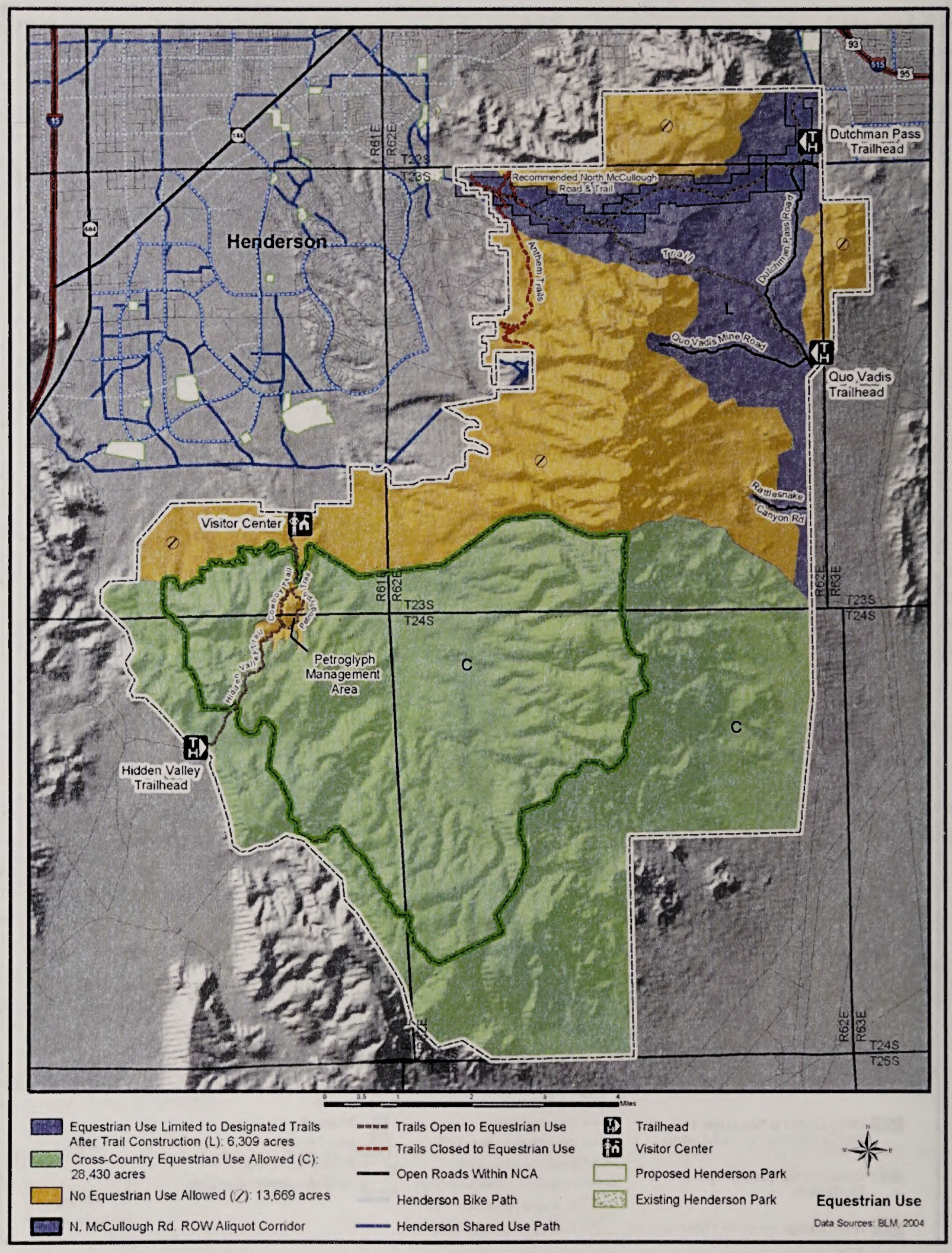
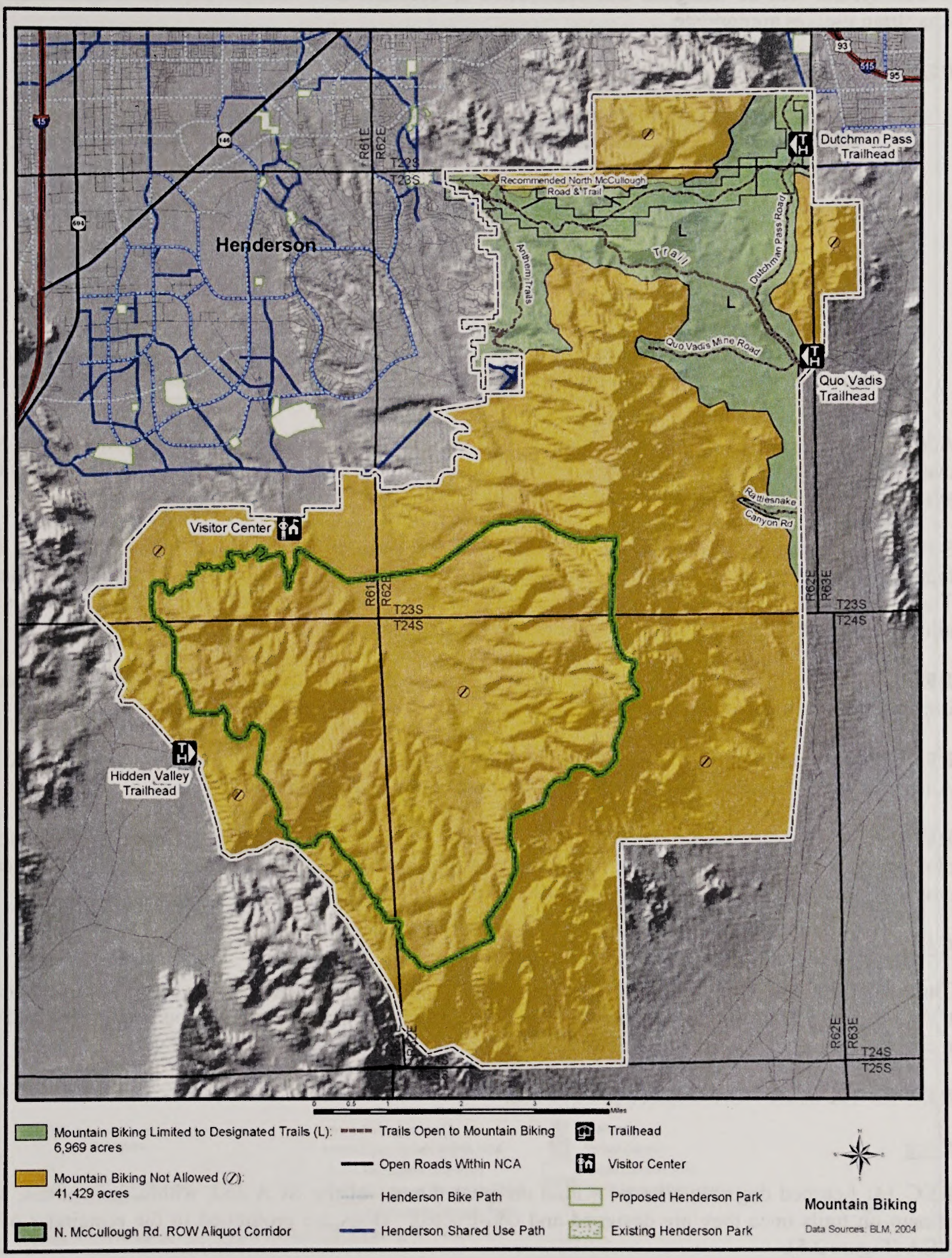


Figure 2.4. Mountain Biking



Trails

A trail system will be designed and constructed to accommodate multiple uses (hiking, biking, and equestrian use), as appropriate.

REC 9: Initially, the following trails are designated:

Desognated Trails	Activities
Petroglyph Trail	Hiking
Cowboy Trail	Hiking
Hidden Valley Trail	Hiking, equestrian use
Anthem Trail System (N-76312)	Hiking, mountain biking
North McCullough Trail (N-65874)	Hiking, equestrian use, mountain biking
Unnamed trail following east-west power line road	Hiking, equestrian use, mountain biking

Additional trails will be planned, designed, and constructed through a systematic process that will evaluate needs, potential uses, suitable destinations, and public interest. Under the approved plan, a trail system with a wide range of uses is anticipated.

Site-specific resource conditions will be considered when selecting trail locations and designing trail features; for example, trails will not be constructed within 1/4-mile of wildlife water developments. Trails development in sensitive natural or cultural areas will be avoided, if possible. Wheelchairs are allowed in the Wilderness, but BLM is not required to facilitate such uses.

REC 10: Trails will be added, as needed, and if their design and construction will not cause unacceptable impacts on sensitive cultural resources, natural resources, or wilderness values.

REC 11: All trails outside the Wilderness will be evaluated and developed with consideration to the Americans with Disabilities Act of 1990 before construction and designation.

REC 12: Any unauthorized constructed or social trails will be evaluated and considered as to whether to close, restore, or adopt them into the trail system. Any unauthorized surface disturbance will be treated as a trespass and subject to appropriate administrative or law enforcement action.

OHV

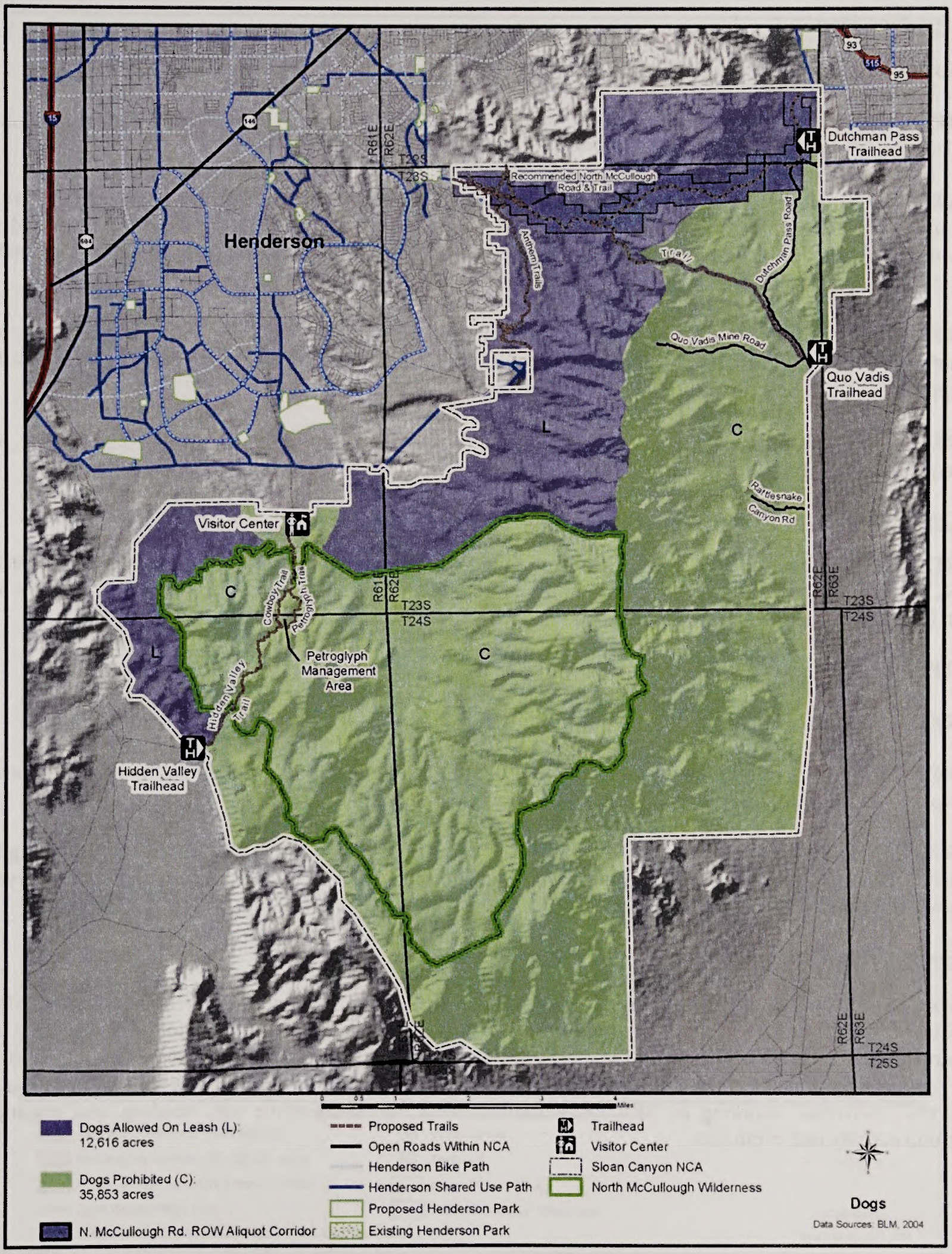
Throughout this plan, the term "OHV" refers to any motorized vehicle capable of operating on roads, trails, or other areas that are not maintained. These vehicles are not required to be street-registered and include motorcycles, all-terrain vehicles (ATV), dune buggies, and four-wheel drive vehicles.

REC 13: The entire NCA is closed to OHV use.

Dogs

REC 14: Leashed dogs are allowed within designated areas of the NCA and, within those areas, must remain on trails once they are designed and constructed. Dogs are prohibited in the remainder of the NCA (Figure 2.5).

Figure 2.5. Dogs



REC 15: Dog feces must immediately be picked up and packed out. Low-profile, natural-colored dispensers for dog waste bags will be placed and maintained at trailheads.

Nighttime Use

No camping sites, water, or other amenities are provided, and campers will have to be self-sufficient.

REC 16: Primitive, dispersed camping is allowed in the areas shown on the Camping Map (Figure 2.6). Camping is prohibited within a 1/4-mile radius of water sources.

REC 17: Campfires are allowed at camping sites in fire pans or with fire blankets; no campfire rings allowed. All fuels must be packed in and packed out. No natural fuels in the NCA may be used for campfires. Fire waste products must be packed out of the NCA. BLM encourages the use of portable gas, jellied petroleum, or pressurized liquid fuel stoves for preparing meals.

REC 18: The Petroglyph Management Area is designated for Day Use Only, with fires, camping, and nighttime use prohibited. Exceptions may be allowed only under special circumstances and with the approval of the Sloan Canyon NCA manager.

REC 19: Permits for overnight parking to support activities, such as camping and night hiking, are required and will be issued in accordance with NCA policy, which will be developed in the future.

Other Recreation Use

REC 20: Bouldering and traditional rock climbing (no permanent anchors) are allowed throughout the NCA, including the Wilderness, except in the Petroglyph Management Area and its northern access and in identified sensitive resource areas.

REC 21: Rockhounding is prohibited within the NCA.

REC 22: Geocaching is prohibited within the NCA.

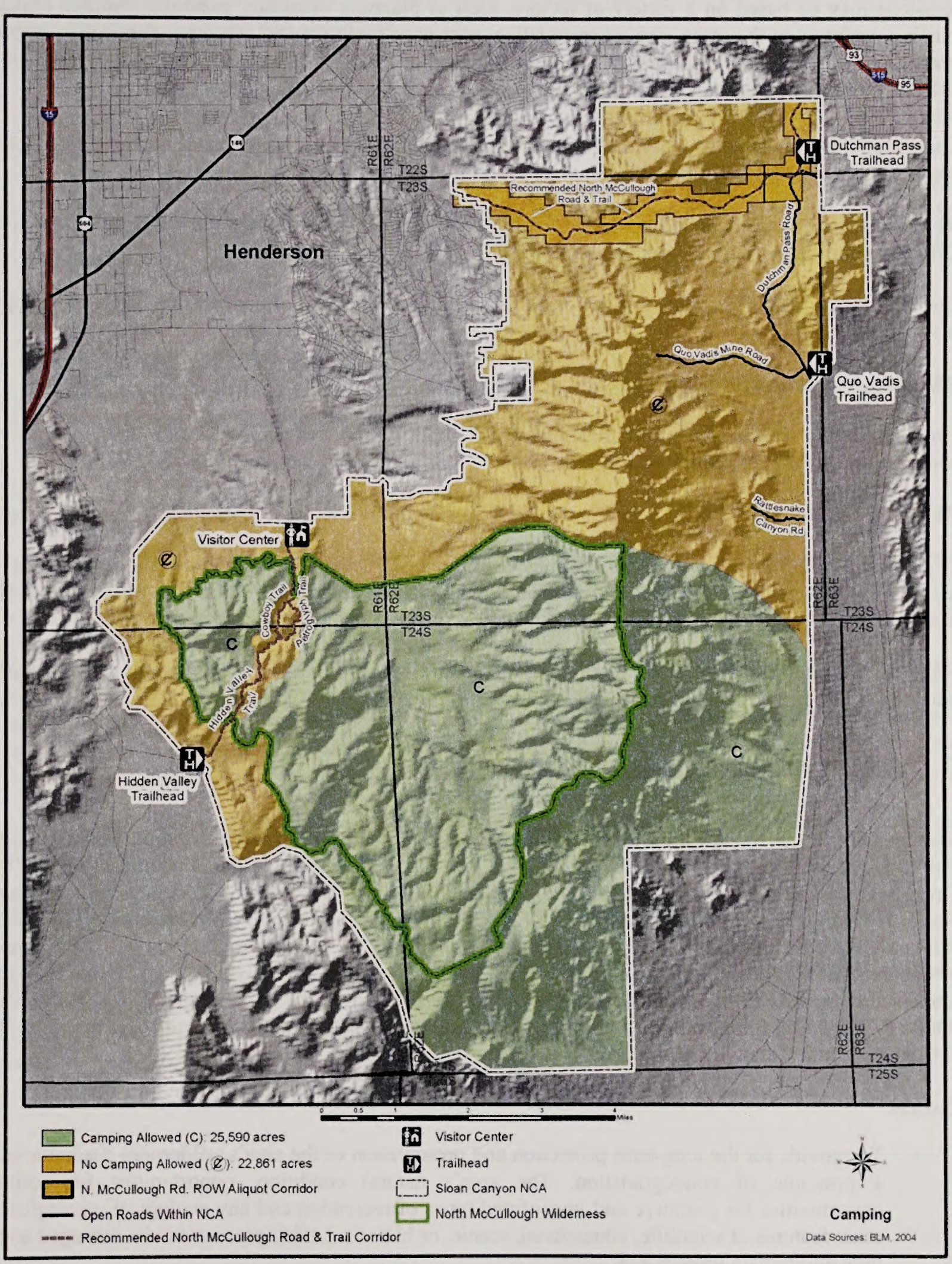
REC 23: All forms of recreational target shooting, including but not limited to firearms, bows, crossbows, and paintball guns, are prohibited throughout the NCA.

REC 24: Hunting is prohibited in the Petroglyph Management Area, but hunting activities, including the use of hunting dogs, are allowed within the remainder of the NCA in conformance with State of Nevada laws and regulations.

Special Recreational Permits

Various recreational uses that could occur within the NCA require a special recreational permit (SRP). SRPs will be issued consistent with the purposes of the NCA and the Wilderness to disperse visitor use, protect natural resources, provide for the health and safety of visitors, and provide a fair return to the Federal Government for the opportunity to make a profit for the commercial recreational use of public lands. Activities requiring an SRP include commercial use, competitive use, vending, and organized group activity and event use.

Figure 2.6. Camping



SRPs will be issued at the discretion of the BLM Las Vegas Field Office Authorizing Officer, who may at any time and without prior notice choose not to issue permits for certain activities or use areas. Such decisions may be based on a variety of factors, such as planning decisions, potential resource impacts, existing outfitters in the same area, overcrowding, past poor performance, and other concerns. Ongoing evaluations of the number, appropriateness, and impacts of SRPs will be conducted, and issuance limits will be considered based on these evaluations.

Commercial use involves an individual or organizations which provide recreational opportunities that are business-related or involve financial gain.

REC 25: Hunting outfitters and guides are required to obtain an SRP through the BLM Las Vegas Field Office Authorizing Officer to operate within the NCA.

Competitive use refers to events and activities that include an element of competition, such as a running race.

REC 26: Competitive SRPs can be issued in the NCA outside the Wilderness.

Vending permits are temporary authorizations to sell goods or services on public lands and are usually in conjunction with a recreational activity.

REC 27: Vending SRPs can be issued in the NCA outside the Wilderness.

Organized Group Activity and Event Use may require an SRP even if not commercial or competitive in nature. The BLM Las Vegas Field Office Authorizing Officer determines when an SRP will be needed based on resource concerns, user conflicts, public health and safety, and other factors.

REC 28: All organized groups are required to obtain an SRP on a case-by-case basis for group activities outside the Petroglyph Management Area.

2.2.3 North McCullough Wilderness

Management of the North McCullough Wilderness is consistent with the Clark County Conservation of Public Lands and Natural Resources Act of 2002 (the Clark County Act), the Wilderness Act of 1964, Grazing Guidelines (House Report No. 101-405), and Wildlife Management Guidelines (House Report No. 101-405). It is also consistent with 43 CFR 6300, BLM Manuals 8560 (*Management of Designated Wilderness Areas*) and 8561 (*Wilderness Management Plans*), BLM Handbook H-8560-1 (*Management of Designated Wilderness Areas*), *Las Vegas Resource Management Plan* (BLM 1998a), Memorandum of Understanding (MOU) between BLM and the Nevada Department of Wildlife (NDOW) (BLM MOU 6300-NV930-0402, Supplement 9), and the *Clark County Multiple Species Habitat Conservation Plan* (MSHCP) (Clark County Department of Comprehensive Planning [CCDCP], 2000).

Goals

- To provide for the long-term protection and preservation of the area's wilderness character under a principle of nondegradation. The area's natural condition, opportunities for solitude, opportunities for primitive and unconfined types of recreation and any ecological, geological, or other features of scientific, educational, scenic, or historical value present will be managed so that they will remain unimpaired.

- To manage the wilderness area for the use and enjoyment of visitors in a manner that will leave the area unimpaired for future use and enjoyment as wilderness. The wilderness resource will be dominant in all management decisions where a choice must be made between preservation of wilderness character and visitor use.
- To manage the area using the minimum tool, equipment, or structure necessary to successfully, safely, and economically accomplish the objective. The chosen tool, equipment, or structure should be the one that least degrades wilderness values temporarily or permanently. Management will seek to preserve spontaneity of use and as much freedom from regulations as possible.
- To manage nonconforming but accepted uses permitted by the Wilderness Act and subsequent laws in a manner that will prevent unnecessary or undue degradation of the area's wilderness character. Nonconforming uses are the exception rather than the rule, therefore emphasis is placed on maintaining wilderness character.

Objectives

- Maintain or improve solitude within the Wilderness.
- Maintain or improve naturalness in the Wilderness to achieve a standard of No Known Surface Disturbances and stable or decreasing non-native plant populations.
- Provide a diversity of opportunities for primitive and unconfined recreation.

Management Direction

Wilderness management actions provide opportunities for primitive and unconfined recreation opportunities, such as hiking and equestrian use, while providing a level of management necessary to protect sensitive resources and wilderness characteristics. Because the North McCullough Wilderness is close to the Las Vegas Valley, its management, including that of the Petroglyph Management Area (Figure 2.7), is intended to be flexible and responsive as use amounts and patterns are established. Monitoring will be used to assess and establish the Wilderness' baseline conditions and document any changes to them. Once the resource baselines are determined, a system such as LAC will be used to establish thresholds for future actions. Visitation will be monitored using techniques, such as contacts with visitors, social surveys conducted at the Wilderness access points, and trailhead register data.

The accompanying approved Wilderness Management Plan contains additional guidance to implement the actions.

Visitation

The Wilderness Management Plan, attached, establishes visitor numbers, group size, and seasonal and area limits so that wilderness characteristics, including solitude, are not affected beyond an acceptable limit. Some or all of the following management techniques may be used to maintain wilderness characteristics and protect resources: number of people at one time, size of party, timing of visits, daily visitation limits, permits, reservations, guides, and self-guided tours.

Figure 2.7. Petroglyph Management Area



WLD 1: Wilderness characteristics will be maintained at or below established thresholds and limits.

WLD 2: To minimize impacts on wilderness characteristics and natural resources of the area, visitation within the Petroglyph Management Area is limited, although different visitation thresholds are established for the remainder of the Wilderness.

WLD 3: If it is found necessary through monitoring, the visitation thresholds limits will be adjusted.

Petroglyph Management Area Visitation

Once residential development on the western side of the NCA is complete, the Sloan Canyon Petroglyph Site will be just a short distance from a large urban population. To manage the potential high number of visitors, to protect the sensitive cultural and natural resources, and to protect wilderness characteristics, detailed management actions were developed. These actions will be implemented once adequate NCA infrastructure is in place.

WLD 4: Visitors to the Petroglyph Management Area during periods of high use, such as weekends and holidays, must join a BLM-sponsored tour. No more than one guided group of no more than 20 people are allowed in the Petroglyph Management Area at one time. With prior reservations, organized groups of 10 to 35 people will be allowed to visit the Petroglyph Management Area, accompanied by BLM-sponsored guides.

WLD 5: During periods of lower use (such as weekdays), visitors may go to the Petroglyph Management Area unaccompanied by a BLM-sponsored guide if they obtain a permit. Self-guided tour permits may be issued from the visitor center at the north entrance to Sloan Canyon or from a roving ranger or at the Hidden Valley Trailhead. A total of no more than 25 permits per hour will be issued for self-guided tours.

When obtaining a permit, all nonguided canyon visitors will experience an interpretive presentation on appropriate visitor use and site etiquette at cultural resources sites and within wilderness. At the visitor center, this may include an interpretive presentation by a ranger, or a video or a static display; but at the Hidden Valley Trailhead or in backcountry locations, it will likely be an informal presentation at the time of permitting, or brochures and kiosk information.

WLD 6: Access to and use of the Petroglyph Management Area is confined to the canyon bottom and a limited number of side trails.

WLD 7: The main access to the Petroglyph Management Area will be controlled through a visitor center located near the NCA boundary at the northern end of the Sloan Canyon wash. Rangers and other BLM staff or designated personnel will patrol the Petroglyph Management Area for visitors entering from points other than the visitor center and will either deny access based on visitation levels or issue a visitation permit.

WLD 8: Use of the Petroglyph Management Area is limited to the visitor center's operational hours, which will be determined by BLM before the center is opened. Exceptions may be allowed only under special circumstances and with the approval of the Sloan Canyon NCA manager.

Hiking and Equestrian Use

WLD 9: Cross-country hiking is allowed throughout the Wilderness, except for the Petroglyph Management area and its north access where hikers must stay on designated trails.

WLD 10: The entire Wilderness is available for cross-county equestrian use, except for the Petroglyph Management area and its north access.

WLD 11: Horse feed and hay must be certified weed-free to prevent the spread of noxious and invasive weeds.

WLD 12: Watering of equestrian and/or pack animals at wildlife water developments is prohibited.

Trails

To minimize resource impacts, trails from both the north and south entrances are designated and will be constructed (Figure 2.8). No developments will be made or offered on the Petroglyph Trail at the rockfall site.

WLD 13: In the Wilderness, there are three trail options—the traditional hike in Sloan Canyon wash (Petroglyph Trail), a newly constructed trail that forks off the traditional wash hike and avoids the rockfall portion of the wash (Cowboy Trail), and access to the Petroglyph Management Area from the south through a designated 1.5-mile trail from the Hidden Valley Trailhead.

WLD 14: Wilderness trails will be added to the system as necessary for the protection of resources and wilderness character.

WLD 15: Site-specific resource conditions will be considered when selecting trail locations and designing trail features.

WLD 16: The development of developments (such as trails) near wildlife water (guzzlers) is prohibited within a 1/4-mile radius of the guzzler.

WLD 17: Minimal permanent developments will be allowed only for the purposes of resource protection measures, enhancement of wilderness values, and erosion control and only after conducting a minimum requirement/minimum tool analysis.

WLD 18: New social trails resulting in resource damage within the Wilderness (not desired for future designation, modification, or use) will be restored after completing a minimum requirement/minimum tool analysis. Low-profile, wilderness-appropriate "Closed" signs will be installed on social trails. Associated recreation use will be dispersed to other locations using area closures, barriers, and visitor information. The visible portions of these social trails will be restored using nonmechanized means and native vegetation. The nonvisible portions of the social trails will be left to restore naturally.

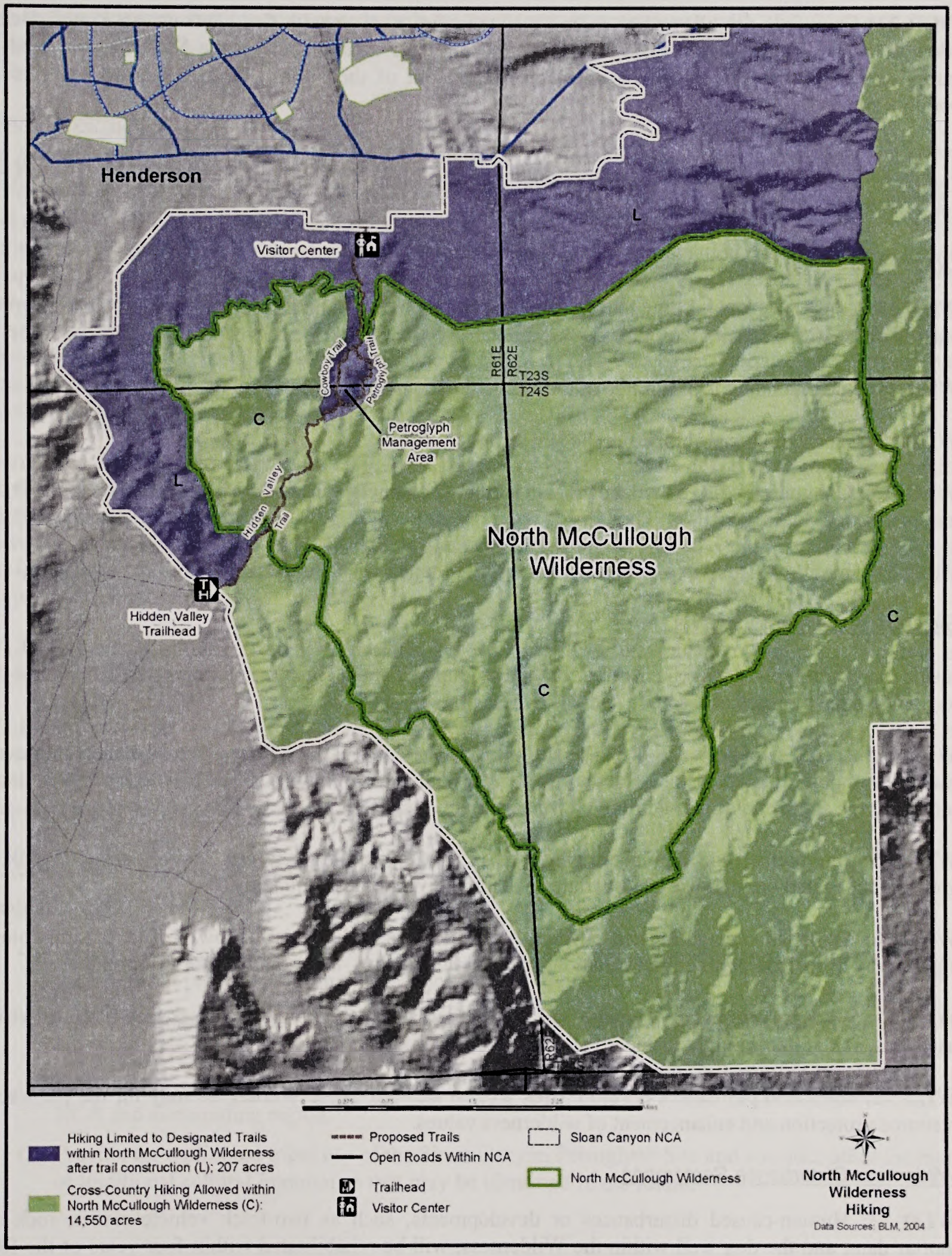
Dogs

WLD 19: No dogs are allowed in the Wilderness.

Nighttime Use

WLD 20: Primitive, dispersed camping is allowed within the Wilderness, except in the Petroglyph Management Area. No camping sites, water, or other amenities are provided, and

Figure 2.8. North McCullough Wilderness Hiking



campers will have to be self-sufficient. In addition, camping is prohibited within a 1/4-mile radius of wildlife water sources.

WLD 21: Campfires are allowed at camping sites in fire pans or with fire blankets; no campfire rings allowed. All fuels must be packed in and packed out. No natural fuels in the NCA may be used for campfires. Campfire waste products must be packed out of the NCA. BLM encourages the use of portable stoves for preparing meals.

WLD 22: The Petroglyph Management Area is designated for Day Use Only, with fires, camping, and nighttime use prohibited. Exceptions may be allowed only under special circumstances and with the approval of the Sloan Canyon NCA manager.

Other Recreation Use

WLD 23: Bouldering and traditional rock climbing (no permanent anchors) are allowed in the Wilderness outside of identified sensitive resource areas, the Petroglyph Management Area, and its northern access.

WLD 24: Rockhounding is prohibited in the Wilderness.

WLD 25: Geocaching is prohibited in the Wilderness.

WLD 26: Commercial SRPs will be issued in the Wilderness on a case-by-case basis; however, no competitive or vending SRPs will be issued.

WLD 27: Hunting is prohibited within the Petroglyph Management Area and its northern access.

Signage and Developments

Inside the Petroglyph Management Area, limited amounts of small signage and interpretive media may be located for the purposes of resource and wilderness protection.

WLD 28: Access signage in the Wilderness indicating that access to the Petroglyph Management Area is restricted to permitted access or guided tours only beyond a certain point will be placed at various places, including the south end of the Petroglyph Management Area.

WLD 29: Interpretive and administrative signs (e.g., trailhead signage and visitor registers) will, in general, be located on high-use access routes outside the Wilderness boundary.

WLD 30: Trailhead signage located outside the Wilderness will consist of low-profile, natural-colored signs and will include pertinent information, such as route details, maps, and visitor information.

WLD 31: Wilderness boundary signage will be installed at all known and potential access routes, visitor use areas, and at line-of-sight distances along the entire Wilderness boundary.

WLD 32: Minimum permanent developments will be allowed in the Wilderness only for the purpose of resource protection and enhancement of wilderness values.

Wilderness Disturbance Restoration

WLD 33: Human-caused disturbances or developments, such as two-track vehicle routes, rock and mortar dam, and the dug well within the Wilderness, will be rehabilitated within four years of the ROD using appropriate resources determined through a minimum requirement/minimum tool analysis for each

rehabilitation project. Any new vandalism and illegal dumping within the Wilderness will be removed or repaired using the same process.

WLD 34: Noxious and invasive weeds will be managed in accordance with the *Partners Against Weeds—An Action Plan for BLM* (BLM 1996 in the *Sloan Canyon Proposed RMP/FEIS* Reference List) initiative for weeds.

Aircraft Overflights

BLM does not have administrative jurisdiction of the airspace above the Sloan Canyon NCA and the Wilderness. The use of aircraft is only regulated by BLM if an aircraft lands or if anything/anyone is picked up or dropped off by means of an aircraft. The Sloan Canyon NCA Act specifically allows military overflights of the Wilderness. Flight testing and evaluation, designation or creation of new units of special use airspace, or establishment of training routes are not precluded. The highest percentage of low-level overflights of the Wilderness is from scenic tours originating from local area airports, although private flights from Henderson Executive Airport, located several miles from the northern Wilderness boundary, also contribute. In addition, commercial flights from McCarran International Airport pass directly over the Wilderness, although they tend to be localized to the western edge and at an altitude of more than 4,000 feet.

Overflights conducted by BLM within the NCA or the Wilderness will be designed to minimize impacts on the NCA and its wilderness characteristics. These overflights will be primarily for the NCA or wilderness monitoring purposes, (e.g., checking for new disturbances and unauthorized vehicle use); however, helicopters may be used to deliver personnel or materials for the purposes of the NCA in conformance with the Sloan Canyon NCA Act, Wilderness Act, and the North McCullough Wilderness Management Plan, attached.

WLD 35: All BLM-administered Wilderness overflights will be conducted to minimize impacts on wilderness characteristics.

WLD 36: Access to the North McCullough Slickrock Catchment 1 (Maintenance Project 4916) will be managed in accordance with the MOU with NDOW and the environmental assessment written for its installation. Significant repairs to the catchment will include notifying BLM, and the analysis of the proposed action through a minimum tool analysis.

2.2.4 CULTURAL RESOURCES

Goals

- Identify and protect cultural resources and ensure that representative resources are available for the benefit of present and future generations.
- Reduce imminent threats from natural or human-caused deterioration, or potential conflict with other resource uses.
- Actively pursue opportunities for scientific research to understand and interpret human use of the NCA and surrounding region.
- Provide for traditional tribal use of the Sloan Canyon Petroglyph Site and consider other locations of traditional cultural importance that may be identified in the future.

Objectives

- Develop educational and interpretive outreach programs to help prevent cultural resources from being disturbed or damaged.
- Interpret the history and prehistory of the NCA to help instill an appreciation for past and current cultures and the values that living cultures associate with the resources of the NCA.
- Develop cooperative efforts with educational institutions, students, tribes, and others for scientific studies, educational opportunities, and enhanced management of the NCA's cultural resources.
- Continue good working relationships with interested Native American tribes.

Management Direction

All proposed actions within the NCA will be subject to compliance with Section 106 of the National Historic Preservation Act in accordance with the Nevada BLM/ SHPO Protocol, Archaeological Resource Protection Act, Native American Graves Protection and Repatriation Act, and other appropriate mandates. In accordance with AIRFA, BLM will ensure that policies enacted under this plan will not inadvertently impair the ability of Native Americans to access the Sloan Canyon Petroglyph Site for traditional cultural purposes. Management actions related to the cultural resource sites within the Wilderness will be within the limits prescribed by the Wilderness Management Plan (attached), and the Clark County Act, Title II ("Wilderness Areas").

The Cultural Resources Management Plan, Appendix C, contains key elements for management of cultural resources during the first stage of implementation of the approved plan. The key elements are—

- A cultural context and relevant research questions for archaeological and ethnographic work that may be conducted in early stages of developing the NCA.
- A treatment protocol to be implemented in the event that Native American human remains are discovered.
- A monitoring plan to establish baseline data and track effects on cultural resources as public use of the NCA grows.

Cultural resources within the NCA will be managed based on use categories as defined in Section 2.4.4 of the Proposed RMP.

CR 1: All physical contact with petroglyphs, such as touching, chalking, and making impressions through rubbings or casting is prohibited except for traditional cultural purposes with a special use permit.

CR 2: Scientific research may be allowed under permit.

CR 3: Approximately half the rockshelters in the NCA will be assigned to the conservation for future use and traditional use management categories. The remainder of rockshelters will be assigned to the scientific, public, and traditional use categories. Rock art locales (other than the Sloan Canyon Petroglyph Site) will follow a similar pattern, with half assigned to the conservation for future use and traditional use management categories and the remainder assigned to the conservation for future use, scientific use, and traditional use categories.

CR 4: Approximately half of other prehistoric and historic sites will be assigned to conservation for future use and traditional use, and the remaining sites will be assigned to scientific, public, and traditional use management categories. Ineligible sites and isolates will be assigned to the scientific use management categories.

CR 5: The Sloan Canyon Petroglyph Site is assigned to the traditional, conservation, public, and scientific use categories.

CR 6: In areas identified as having a medium to high potential for cultural resource sites (Duke et al. 2004), a Class III cultural resources inventory (100 percent) is required prior to any land disturbing undertaking.

CR 7: For areas with a low potential density for cultural resource sites, a reconnaissance-level inventory is required prior to land disturbing activities. Areas with a low potential will be considered for elimination of inventory requirements when sufficient information is available.

CR 8: Maximum fire suppression will be used in the Petroglyph Management Area and the Wilderness areas with a high or medium potential for cultural resources will use flexible fire suppression, with a cultural resource advisor assigned to the fire.

CR 9: In areas with low potential for cultural resources, fire control will be discretionary, and actions will comply with the *Fire Management Plan* (BLM 2004b in the *Sloan Canyon Proposed RMP/FEIS* Reference List) and Wilderness limitations. A resource advisor is required for all fires within the NCA.

2.2.5 Special Designations—Areas of Critical Environmental Concern

Goal

Protect areas with relevant and important cultural, natural, or geological values.

Objective

Develop management prescriptions to protect the important values of the NCA.

Management Direction

The Sloan Canyon Petroglyph Site is managed to ensure regulatory compliance with the management prescriptions established through the Approved RMP. These prescriptions supersede the prior area of critical environmental concern (ACEC) designations, providing a greater degree of protection and management.

ACEC 1: The Sloan Rock Art District ACEC designation is eliminated.

2.2.6 Visual Resources

Goal

Manage all activities in a manner that conserves, protects, and enhances the NCA's scenic resources.

Objective

Manage activities within the NCA to adhere to the Visual Resource Management (VRM) class objectives.

Management Direction

VR 1: Signage, structures, and facilities will be designed in accordance with applicable VRM objectives.

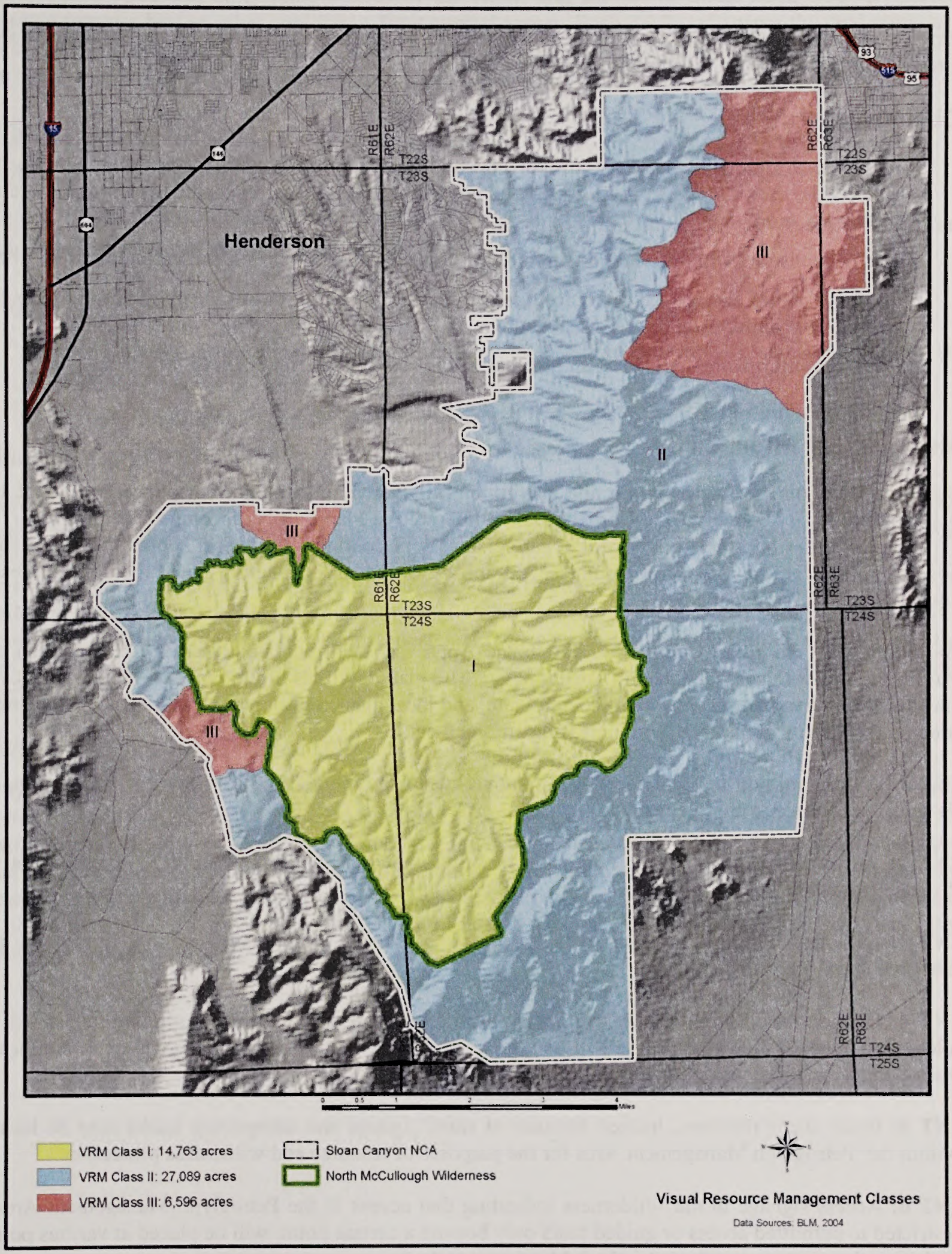
VR 2: VRM classes are based on the Visual Resource Inventory, as described in Appendix D, including designating the North McCullough Wilderness as VRM Class I.

VR 3: VRM classes are designated as shown on the VRM Classes Map (Figure 2.9).

VR 4: The following VRM class definitions are used:

- VRM I—Preserve the existing character of the landscape. Authorized actions may not modify the existing landscape or attract the attention of casual viewers.
- VRM II—Retain the existing character of the landscape. The level of change to the characteristic landscape should be low and may not attract the attention of casual viewers.
- VRM III—Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate and may minimally attract the attention of the casual viewer.

Figure 2.9. Visual Resource Management Classes



2.2.7 INTERPRETATION

Goal

Provide opportunities for users, both onsite and offsite, to develop an appreciation of the NCA's resources through informational and inspiring interpretive experiences.

Objectives

- Provide a variety of opportunities for education, accurate information, and interpretation that meets the user's needs (e.g., tours, kiosks, brochures, virtual tours, website, libraries, community outreach, etc.).
- Provide visitors with information on traditional uses that will be developed with interested tribes.
- Provide interpretation that promotes stewardship behavior in users so they will act in a way that minimizes impacts on the NCA's resources.
- Provide information, guidance, and regulations for visits and orientation to facilities.
- Increase public awareness of management goals for the NCA.

Management Direction

Based, in part, on the Interpretation and Environmental Education Strategy developed as part of this planning process (Appendix E), a Comprehensive Interpretive Plan will be developed for the NCA. As encouraged in the Interpretation Strategy, partnerships will continue with tribes, cooperating agencies, not-for-profit organizations, and volunteer organizations when conducting interpretation, outreach, education, and facility planning.

As required by the Sloan Canyon NCA Act, the Approved RMP contains a Litter Cleanup Plan and Public Lands Awareness Campaign (Appendix F). The plan describes a program that includes concepts such as developing partnerships with federal, State, and local agencies, increasing volunteer involvement, preparing educational material, and increasing enforcement.

INT 1: A program will be implemented to remove litter from the NCA and to prevent future dumping through education and enforcement.

INT 2: A full range of interpretive media will be provided, with media visibility decreasing as the distance from developed areas increases.

INT 3: Stationary interpretive media will be limited to specific areas identified for interpretation and designed to reduce visual impacts.

INT 4: Outside the Wilderness, the use of low-profile, visually unobtrusive interpretive media will be allowed in areas of high use. There will be a focus on highly visible media at staging areas (trailheads, visitor contact station, visitor center).

INT 5: Inside the Wilderness, limited amounts of small signage and interpretive media may be located within the Petroglyph Management Area for the purposes of resource and wilderness protection.

INT 6: Access signage in the Wilderness indicating that access to the Petroglyph Management Area is restricted to permitted access or guided tours only beyond a certain point, will be placed at various points, including the south end of the Petroglyph Management Area.

INT 7: Media, such as virtual tours, will be developed to provide opportunities for education and interpretation at the visitor center and on the Web for those unable to access the NCA, or the Petroglyph Management Area and other remote areas of the NCA, and for use at times when weather, such as extreme summer heat or other conditions, limit normal access. Such media will serve the dual purpose of reducing impacts on resources and enhancing wilderness experience. In general, there will be a focus on the use of interactive virtual interpretation media, such as websites.

2.2.8 FACILITIES

Goal

Enhance visitor use and experience by providing appropriate facilities compatible with the character and characteristics of the NCA's resources.

Objectives

- Provide appropriate access points with relevant interpretive opportunities, signage, mapping, and information specific to that area.
- Provide appropriate facilities and/or infrastructure to support management of the NCA.

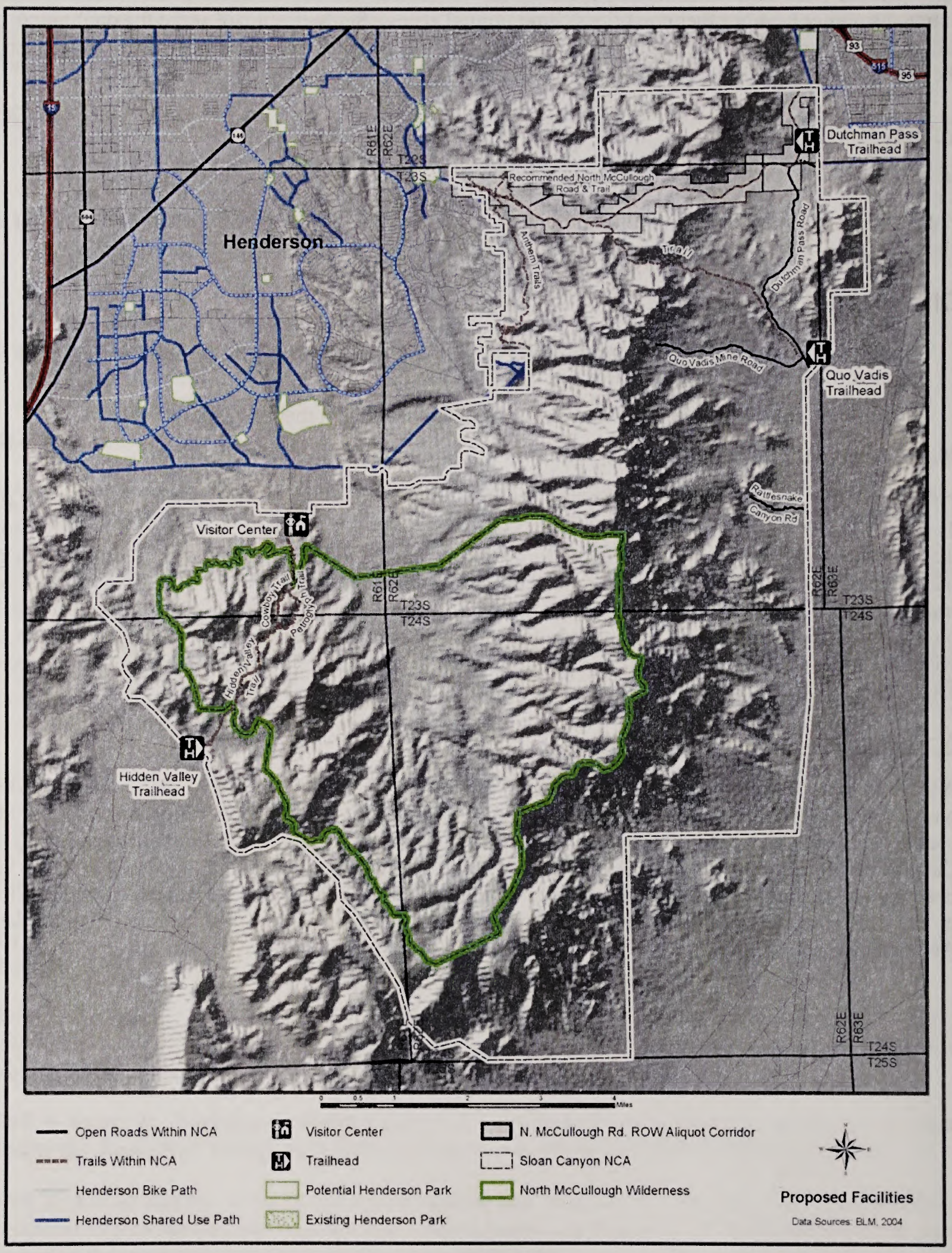
Management Direction

Developed access points into the NCA includes the northern entrance of Sloan Canyon, Hidden Valley Trailhead, Dutchman Pass Trailhead, and the Quo Vadis Trailhead. Figure 2.10, Proposed Facilities Map, depicts the locations of these facilities. Information on the NCA may be provided at facilities located outside the NCA, such as schools and libraries located throughout the City of Henderson. Additional trails and facilities may be added throughout the NCA, as needed, in accordance with the applicable MEA objectives. The facilities will be planned, designed, and constructed through a systematic process that will evaluate needs, potential uses, and public interest as well as the preparation of an environmental assessment.

Northern Entrance of Sloan Canyon

A visitor center will provide NCA management with office space, serve as one of the access and control points for the Petroglyph Management Area, and be the base of operations for patrols and rangers. The central theme of the visitor center is the NCA's association with Native Americans including the Sloan Canyon Petroglyph Site and the tribes who have been involved in the planning process. The tribes have been invited to continue association with the NCA as interpretative media is developed and to participate in the design of the visitor center, which could include design elements to facilitate ongoing Native American use and/or events.

Figure 2.10. Proposed Facilities



The visitor center could include offsite space for BLM staff, law enforcement, volunteers, and visiting scholars and researchers, and a visitor permit window or desk. The center could have facilities for maintenance and storage, areas for interpretive use, an outdoor amphitheater, classrooms, research facilities, archival storage, a book store/gift shop, meeting rooms, and concessions.

FAC 1: A visitor center will be constructed near the NCA boundary at the north entrance to Sloan Canyon.

FAC 2: A business plan will be developed for the NCA that will explore income-generating facilities, including space in the visitor center to be leased for food/restaurant facilities and the viability of day rentals of space for meetings or small corporate retreats.

Hidden Valley Trailhead

FAC 3: A trailhead will be constructed near the NCA boundary at Hidden Valley that could include a parking lot, an equestrian staging area, an interpretive kiosk, and a vault toilet.

Dutchman Pass Trailhead

FAC 4: A trailhead will be constructed at Dutchman Pass Trailhead that could include a parking lot, an equestrian staging area, an interpretive kiosk, and a vault toilet

Quo Vadis Trailhead

FAC 5: A trailhead will be constructed at Quo Vadis that could include a parking lot, an equestrian staging area, an interpretive kiosk, and a vault toilet

2.2.9 LANDS AND REALTY

Goal

Manage land and realty actions within the NCA in accordance with the Sloan Canyon NCA Act and the Clark County Act, Title II ("Wilderness Areas").

Objective

Allow only development and establishment of new interests within the NCA that are consistent with the intent of the Sloan Canyon NCA Act.

Management Direction

In accordance with the Sloan Canyon NCA Act, all existing rights at the time of passage of the Clark County Act (November 6, 2002) are recognized. The North McCullough Wilderness, which includes the Petroglyph Management Area, is an exclusion area for all types of ROWs.

LAND 1: Existing communication ROWs may be renewed at the end of their term in accordance with the *Black Mountain Communication Site Plan* (BLM 1999 in the *Sloan Canyon Proposed RMP/FEIS* Reference List) and current regulations, and may be updated or modified to meet the intent of the Sloan Canyon NCA Act. No new communication sites will be authorized under the Sloan Canyon NCA Act.

LAND 2: Other valid existing ROW grants may also be renewed at the end of the term and modified to meet the intent of the Sloan Canyon NCA Act and current regulations. If a subleasing right, such as one for fiber optics, existed as of November 6, 2002, that right continues. New ROWs or amendments to

existing ROWs will be considered on a case-by-case basis and authorized only if they serve the purposes of the NCA.

LAND 3: Outside the Wilderness, applications for new linear or site-type ROWs, or any amendments to existing ROWs, will be considered on a case-by-case basis within the NCA if the action furthers the purpose of the NCA in Section 602 of the Sloan Canyon NCA Act (Figure 2.11).

Evaluation criteria will include, in part—

- Direct benefit to the NCA, such as utilities to serve NCA facilities.
- Maintaining or decreasing visual contrast.
- Reduction of disturbed areas.
- Improvement in road/ROW alignments to minimize resource impacts.

LAND 4: Commercial filming permits are allowed in the NCA, outside of the Wilderness, with location, timing, vehicle, and crew size restrictions. Film permits are limited to designated trails and trailheads and are not allowed in the Petroglyph Management Area. Filming is prohibited on weekends and federal holidays. In addition, vehicles associated with the film permit may not occupy more than half of the parking area capacity and are not allowed to create new ground disturbances. The crew size is limited to a maximum of 15 people per permit for still photography, and a maximum of 15 people per permit for motion photography.

LAND 5 : Special use permits (2920 Permits) would be allowed if they meet the intent of the Sloan Canyon NCA Act. Special use permits are issued for purposes such as temporary or permanent facilities for commercial purposes and construction equipment storage sites (43 CFR 2920).

2.2.10 TRANSPORTATION (REGISTERED MOTORIZED VEHICLES)

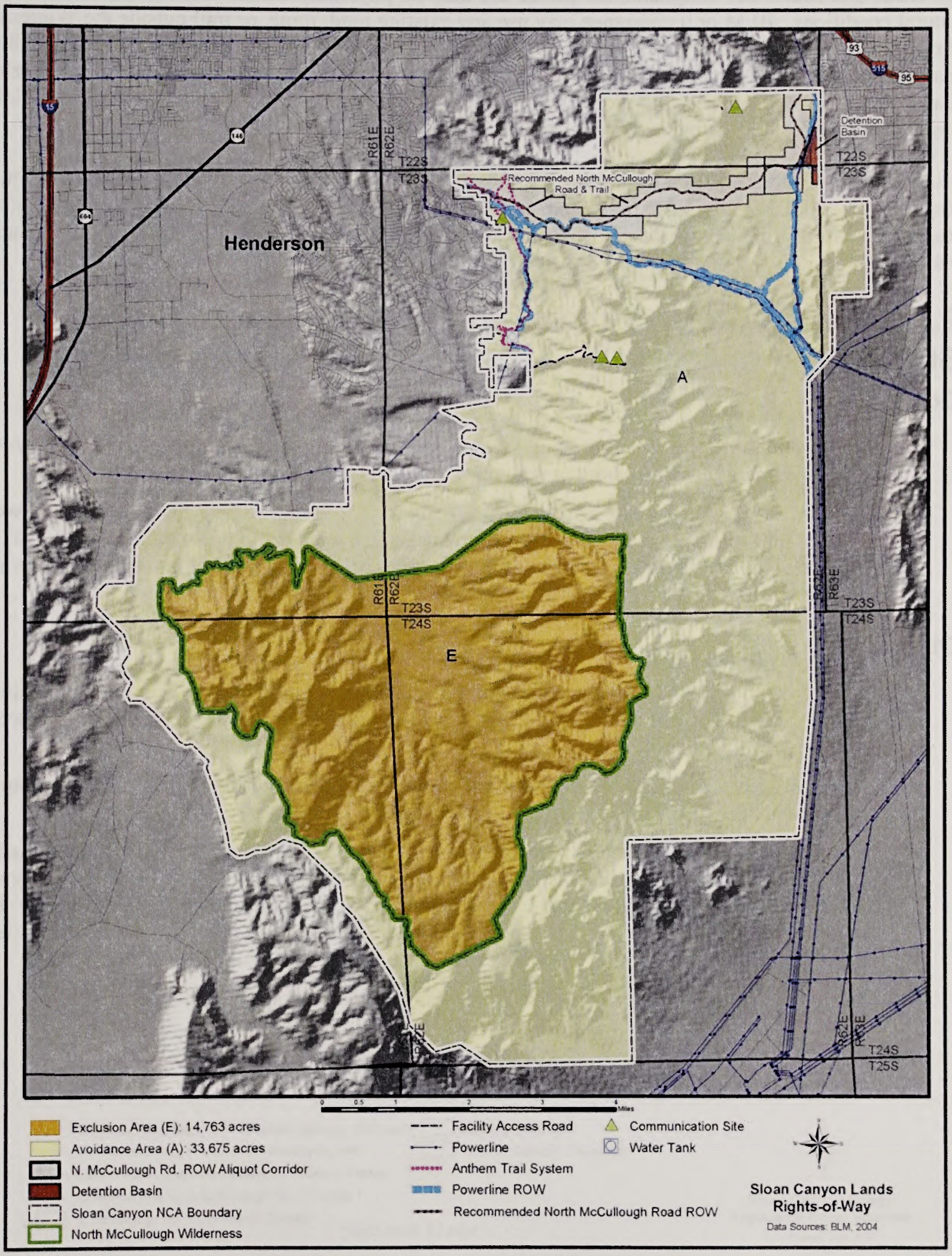
Goal

Provide public and administrative access to the NCA.

Objective

Provide and maintain a system of roads and routes for registered motorized vehicles within the NCA but outside the North McCullough Wilderness.

Figure 2.11. Sloan Canyon Lands Rights-of-Way



Management Direction

All roads and routes not designated for public use may be physically barricaded, signed, or restored to natural conditions. BLM or its designee may use any existing road, route, or trail outside the Wilderness for administrative or emergency purposes. Motorized vehicles may be authorized for installing, maintaining, and reconstructing water development projects outside the Wilderness, including guzzlers, that will enhance the NCA by promoting healthy, viable, and more naturally distributed wildlife populations, subject to existing laws, regulations, policies, plans, or agreements.

The North McCullough Road, Dutchman Pass Road, Quo Vadis Mine Road, and Rattlesnake Canyon Road are open to the public for registered vehicles as shown in Figure 2.12, Sloan Canyon Roads—Registered Motorized Vehicles Map. All other roads and routes are closed to the public for registered vehicle use.

2.2.11 Vegetation Management (including Special Status Species)

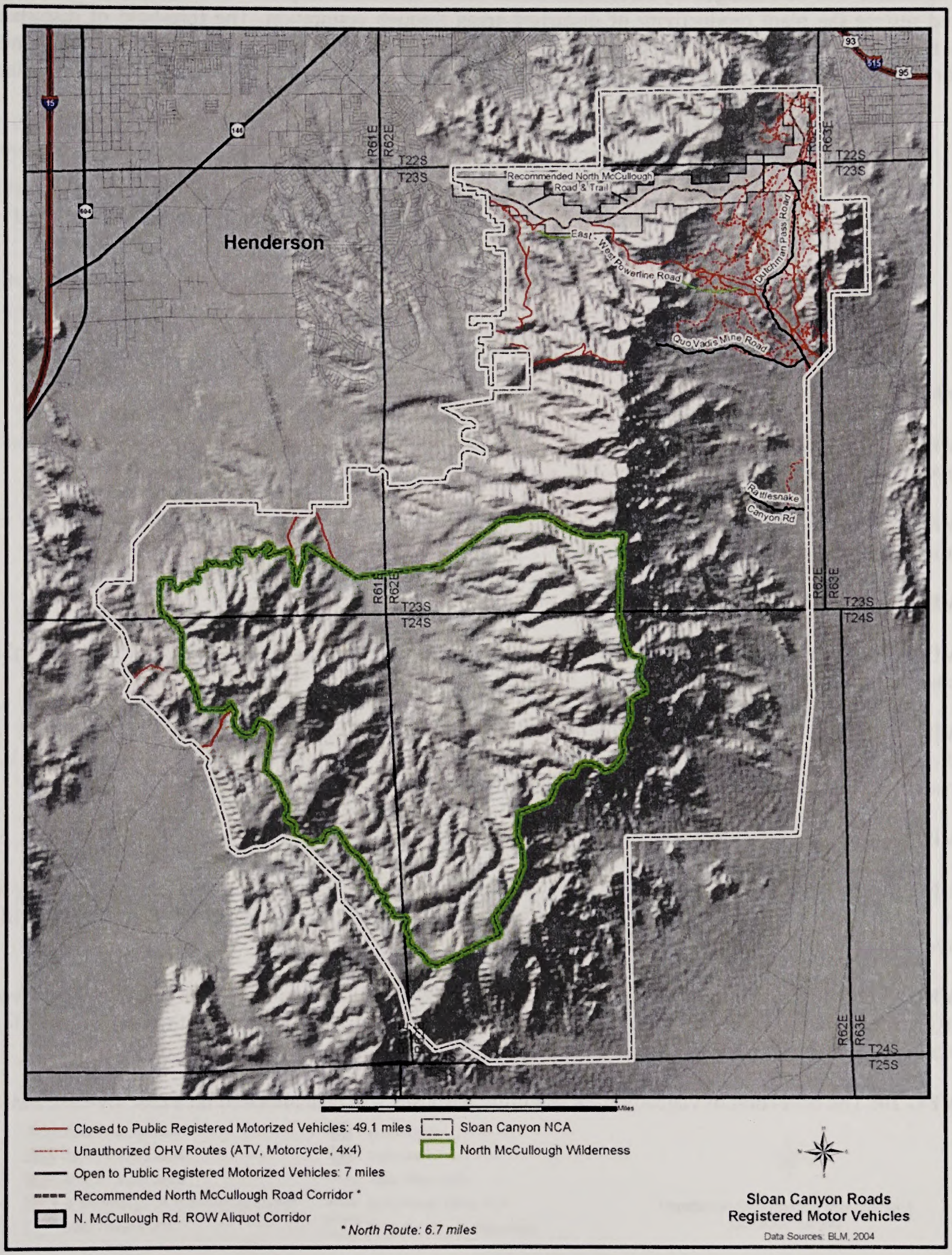
Goals

- Manage the NCA to maintain or improve the condition of native vegetation to achieve a potential natural community when consistent with other goals and objectives for the NCA.
- Establish an integrated weed management program by cooperating with State and county weed programs and building cooperative weed management areas to implement the goals of the *Partners Against Weeds—An Action Plan for the BLM* (BLM 1996 in the *Sloan Canyon Proposed RMP/FEIS* Reference List) initiative.

Objectives

- Manage to protect priority plant species and habitats, including federally listed, State-sensitive, and MSHCP (CCDCP 2000 in the *Sloan Canyon Proposed RMP/FEIS* Reference List) species within the NCA.
- Place a priority on the use of native plant species for vegetation restoration and landscaping developed areas.
- Protect the natural condition and biodiversity of the NCA by preventing or limiting the spread of noxious and invasive weeds that displace native vegetation, through integrated weed management principals to detect and eradicate all existing infestations, eliminate new infestations before they begin to spread, and prevent or limit the spread of established weeds into areas containing little or no infestations.
- Prevent the increase of total acres dominated by invasive annual species within the NCA.

Figure 2.12. Sloan Canyon Roads Registered Motorized Vehicles



Management Direction

Vegetation will be managed by restoration zones based on MEAs to promote native plant communities and restore the plant productivity of disturbed areas through restoration. The threshold of disturbance before restoring the natural vegetation community or improving the condition of native plant communities for each zone will be as follows and is shown in Figure 2.13, Vegetation Disturbance Management Map:

- Zone 1 (Primitive MEA)—Conduct restoration if the surface disturbing activity may alter the natural vegetation community processes or if it reduces the viability of local species populations.
- Zone 2 (Semi–Primitive, Non-Motorized MEA)—Conduct restoration if the surface disturbing activity may have a short-term impact on natural vegetation community processes or if it reduces the viability of local species populations.
- Zone 3 (Roaded Natural and Developed MEAs)—Conduct restoration if the surface disturbing activity may have a long-term impact on natural vegetation community processes or if it could have a long-term impact on local species populations.

VEG 1: Manage vegetation restoration by zone, as shown in Figure 2.13.

VEG 2: Restoration projects take priority in Zones 1 and 2 to restore or improve conditions in native plant communities (Appendix G, Vegetation Restoration Strategy).

VEG 3: Disturbed areas in the North McCullough Wilderness will be restored after completion of a minimum requirement/minimum tool analysis.

VEG 4: Commercial and casual collection of vegetation is prohibited throughout the NCA.

VEG 5: Sensitive and Special Status Species habitats will be protected to ensure suitable habitat conditions and population viability.

VEG 6: Scientific research and monitoring of Special Status Species will be encouraged. BLM will develop partnerships with organizations, such as universities and other educational groups, to facilitate research on and monitoring of Special Status Species.

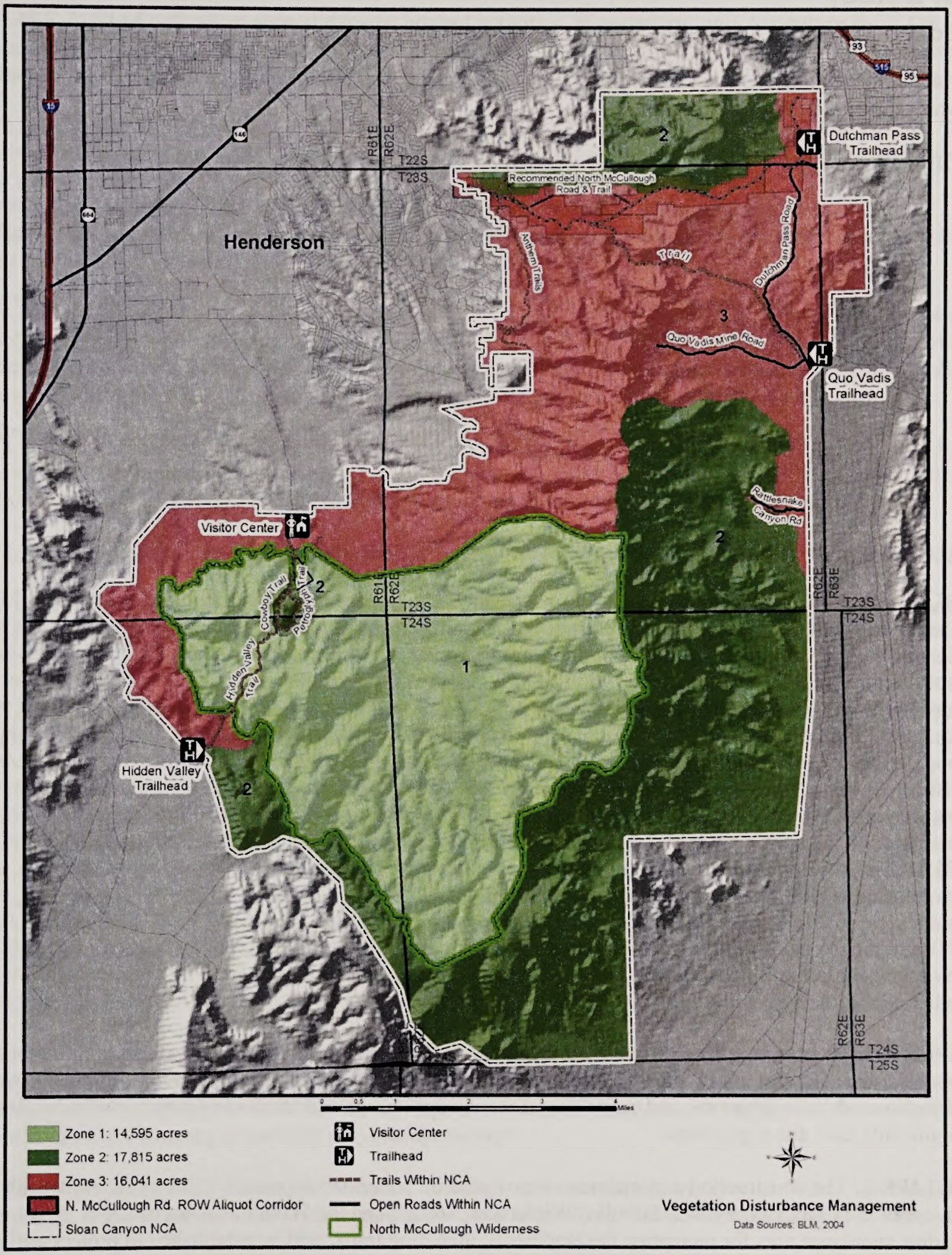
VEG 7: Any developed landscaping will use only plant species native to the NCA.

VEG 8: Sites proposed for disturbance will be evaluated for the presence of Special Status Plant Species. In addition, surface disturbing activities within known locations of federally listed plant species will be avoided, if feasible.

VEG 9: BLM will continue ongoing efforts to survey, monitor, and manage invasive and noxious weeds using integrated weed management principals. This effort includes working with local organizations, agencies, and landowners to promote education and to assist in managing weeds.

VEG 10: The collection of vegetation for scientific purposes will be authorized on a case-by-case basis.

Figure 2.13. Vegetation Disturbance Management



2.2.12 WILDLIFE MANAGEMENT (INCLUDING SPECIAL STATUS SPECIES)

Goal

Maintain and enhance native wildlife resources and provide for biological diversity of wildlife resources while ensuring healthy ecosystems.

Objectives

- Manage to protect Special Status Wildlife Species and habitats in the NCA, including federally listed, State-sensitive, and MSHCP species, according to existing law, regulation, policy, and/or agreement.
- Maintain or enhance habitat quality and quantity to adequately support the life history requirements of a diversity of wildlife species.
- Promote healthy and viable wildlife populations through appropriate habitat and species management actions that will lead to providing for ecological integrity within the NCA.
- Protect important migratory bird habitat according to existing law, regulation, policy, and/or agreement.
- Maintain lambing areas and movement corridors for bighorn sheep.

Management Direction

BLM will work cooperatively with NDOW and the U.S. Department of Agriculture Animal and Plant Health Inspection Service/Wildlife Services in the management of wildlife (including Special Status and Sensitive Species, hunting, and trapping), recognizing their respective management jurisdictions. Specifically, BLM will coordinate with NDOW in providing habitat for maintenance of population objectives and management activities designed to moderate populations (e.g., hunting, trapping, and transfer). For example, BLM will manage bighorn sheep habitat to promote healthy and viable populations consistent with the *Rangewide Plan for Managing Bighorn Sheep Habitat on Public Lands* (BLM 1998c in the *Sloan Canyon Proposed RMP/FEIS* Reference List). BLM will also follow the objectives of the *MSHCP* (CCDCP 2000 in the *Sloan Canyon Proposed RMP/FEIS* Reference List) to maintain or improve current and potential wildlife habitat toward full ecological potential. In addition, BLM has developed a Biological Management Strategy (Appendix H) to guide the research and monitoring of wildlife species found within the NCA.

Within the North McCullough Wilderness, BLM will follow its MOU with NDOW for wildlife management in the Wilderness (BLM 2003c in the *Sloan Canyon Proposed RMP/FEIS* Reference List) or other applicable agreement policy.

WLIFE 1: BLM will enhance wilderness values by maintaining existing water developments to promote healthy, viable, and more naturally distributed wildlife populations; constructing additional water developments, if appropriate; and protecting or improving springs and seeps consistent with the MOU and applicable laws and regulations.

WLIFE 2: The construction and maintenance of wildlife water developments will be consistent with the intent of the Clark County Act, Title II ("Wilderness Areas") and the Wilderness Act of 1964. A 1/4-mile radius avoidance area for recreation developments, including trails, will be established to protect artificial

and natural waters that provide benefit to wildlife. BLM will also prohibit livestock watering at wildlife water developments.

WLIFE 3: BLM will allow animal damage control activities, if necessary, on a temporary basis for the successful reestablishment of native species, for the recovery of decimated populations, and to manage urban interface wildlife conflicts.

WLIFE 4: To better understand the NCA's wildlife, BLM will implement monitoring surveys for appropriate species, and wildlife observation studies will be allowed in the NCA as long as the study does not harass species.

WLIFE 5: Interpretive information designed to mitigate the potential effects of recreation use on wildlife will be developed and distributed within the NCA.

WLIFE 6: Designation and construction of trails, facilities, and ROWs will be limited within known lambing areas of bighorn sheep. Surface disturbing activities will be limited within known lambing areas from January through May. Trail construction will be avoided in areas of known bighorn sheep movement between the North and South McCullough Mountains.

WLIFE 7: Permits for wildlife specimen collection will be issued for scientific purposes on a case-by-case basis. All applicants who intend to collect specimens of listed species will be required to obtain additional permits from NDOW and USFWS.

WLIFE 8: Casual and commercial collection of reptiles is prohibited throughout the NCA.

Distance and seasonal restrictions for sensitive raptor nesting areas and lambing areas will be determined on a case-by-case basis and will depend on the species involved, natural topographic barriers, and line-of-sight distances.

WLIFE 9: Visitors will be educated to be sensitive to raptor nesting areas during breeding season and bighorn lambing areas from January to May.

WLIFE 10: Construction of trails, facilities, or ROWs will be seasonally restricted within an appropriate distance of occupied raptor nesting sites. Trails will be closed using seasonal or small area closures on a case-by-case basis to protect wildlife species during critical life periods.

WLIFE 11: Feral animals, including wild horses and burros, will be removed from the NCA by coordinating with appropriate local, State, and federal agencies on the trapping and transfer of populations of animals posing a threat to wildlife health or human health and safety.

WLIFE 12: Bird feeders are prohibited within the NCA.

WLIFE 13: Special Status Species habitat will be maintained and protected to ensure suitable habitat conditions and viable populations. Disturbance or development will be avoided in areas of Special Status Species potential habitat. Disturbance or development will be mitigated in areas of Special Status Species habitat discovered during preactivity site-specific surveys.

WLIFE 14: BLM will encourage scientific research and monitoring of Special Status Species and encourage research partnerships with organizations such as universities and other educational groups.

2.2.13 WILDLAND FIRE MANAGEMENT

Goals

- Manage fire to protect human health and property.
- Manage fire to keep wildland fire size to an absolute minimum to prevent conversion to red brome and other non-native grasses.

Objective

Protect human health and property.

Management Direction

Using the appropriate management response, BLM will provide wildland fire suppression efforts commensurate with resources and risk to adjacent property values. Education, law enforcement, and public outreach will be used to prevent or minimize risk of human-caused fires. Maximum fire protection will be provided through a comprehensive fire detection system using a multiagency approach.

FIRE 1: An NCA staff resource advisor will be consulted on all fires in the NCA. For specific fire suppression guidance, BLM will follow the *Fire Management Plan* (BLM 2004b in the *Sloan Canyon Proposed RMP/FEIS* Reference List).

2.2.14 WATER RESOURCES AND QUALITY

Goal

Ensure NCA activities protect water resources and quality.

Objectives

- Manage and protect springs and water sources within the NCA.
- Maintain or improve the water quality within the NCA.

2.2.15 AIR QUALITY

Goal/Objective

Ensure that emissions associated with NCA activities meet federal, State, and local air quality regulations and standards.

2.2.16 LIVESTOCK GRAZING

Goal

Manage authorized livestock grazing consistent with the purposes of the Sloan Canyon NCA Act and the Clark County Act, Title II ("Wilderness Areas").

Objective

Manage livestock grazing in the Sloan Canyon NCA to attain the Standards—desired rangeland conditions, and expressions of physical and biological conditions required for sustaining rangelands for multiple uses, as approved in Nevada's *Mojave-Southern Great Basin Resource Advisory Council* (*RAC*),

Standards and Guidelines for Rangeland Health and Guidelines for Grazing Administration (BLM 1997 in the *Sloan Canyon Proposed RMP/FEIS* Reference List).

Management Direction

GRAZ 1: If on-the-ground evaluations determine that forage is available, BLM will allow livestock grazing in the Hidden Valley Allotment, consistent with allotment-specific objectives.

GRAZ 2: Grazing in the allotment will continue unless the permittee voluntarily relinquishes the privilege, permits, or leases, in which case, the allotment will be closed to further livestock grazing.

GRAZ 3: Cattle are the only class of livestock authorized to graze on the Hidden Valley Allotment. Horses may be kept in corrals and used to perform ranch-related work.

GRAZ 4: BLM will manage the range resource consistent with the phenological and physiological requirements of key perennial species. Livestock grazing management will provide for increased plant vigor and reproductive capability of perennial forage to either maintain a static trend or achieve an upward trend of key perennial forage.

GRAZ 5: Placement of salt and mineral supplements and new range improvements is prohibited within the NCA.

2.2.17 Geology and Soils

Goals

- Conserve and protect geological and soil resources within the NCA.
- Provide opportunities for scientific research within the NCA to understand and interpret the NCA's geologic history.

Objective

Manage activities within the NCA to maintain natural rates of soil loss and sedimentation.

Management Direction

GEO 1: Intrusive geologic research is allowed in the NCA by permit to ensure regulatory compliance.

GEO 2: Intrusive geologic research is prohibited in the Petroglyph Management Area and its northern access, and appropriate restrictions apply in the remainder of the Wilderness.

2.2.18 Minerals

Goal/Objective

Recognize valid existing mineral rights in accordance with existing law, regulation, and policy.

2.2.19 Abandoned Mines

Goal/Objective

Reduce potential safety hazards associated with abandoned mines.

Management Direction

BLM will ensure that abandoned mine hazards are considered during planning, design, and construction of NCA facilities. When consistent with other resource objectives, abandoned mines will be closed.

2.2.20 HAZARDOUS MATERIALS

Goal

Reduce potential for hazardous materials contamination within the NCA.

Objectives

- Prevent illegal disposal of hazardous materials.
- Ensure that NCA management actions are designed to minimize hazardous waste generation and prevent pollution.
- Assess the impacts of released hazardous materials and determine the appropriate response, removal, and remedial actions.

NORTH MCCULLOUGH WILDERNESS MANAGEMENT PLAN

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WILDERNESS MANAGEMENT PLAN

U.S. Department of the Interior

Bureau of Land Management

Las Vegas Field Office
Las Vegas, Nevada

September 2005

NORTH MCCULLOUGH WILDERNESS MANAGEMENT PLAN

Sloan Canyon National Conservation Area





SLOAN CANYON
NATIONAL CONSERVATION AREA

Record of Decision
for the
Approved Resource Management Plan/
Final Environmental Impact Statement
and Approval of the
North McCullough Wilderness Management Plan

Prepared by
U.S. Department of Interior
Bureau of Land Management
Las Vegas Field Office

Cooperating Agencies:
Nevada Department of Wildlife (NDOW)
Nevada State Historic Preservation Office (SHPO)
Clark County Department of Comprehensive Planning
City of Henderson
Boulder City
Las Vegas Paiute Tribe
Paiute Indian Tribe of Utah
Fort Mojave Indian Tribe

Juan Palma 5/25/06

Juan Palma Date
Recommended
Bureau of Land Management
Field Manager, Las Vegas Field Office

Ron Wenker 5/30/06

Ron Wenker Date
Approved
Bureau of Land Management
State Director, Nevada

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NORTH MCCULLOUGH WILDERNESS MANAGEMENT PLAN

1.0 INTRODUCTION

1.1 Scope of the Wilderness Management Plan

Developed in conjunction with the Sloan Canyon National Conservation Area (NCA) planning process, this North McCullough Wilderness Management Plan (WMP) provides specific direction for the management of the North McCullough Wilderness (Wilderness) over the next 10 years. It (1) describes the Wilderness including existing conditions, features, and uses; (2) identifies the goals and objectives in the management of the Wilderness; (3) identifies the issues as developed by Bureau of Land Management (BLM) specialists, other agencies, and the public during scoping for the Sloan Canyon NCA Resource Management Plan (RMP) and Environmental Impact Statement (EIS); (4) identifies assumptions concerning changes expected during the life of the WMP; (5) presents a management strategy to maintain or improve the natural character of the Wilderness; (6) provides specific direction for the management of the various resources and activities within the Wilderness to ensure the preservation of the area's wilderness character, (7) establishes a monitoring strategy that tracks the outcome of activities undertaken within the Wilderness; and (8) identifies a sequence of activities necessary for the implementation of this WMP.

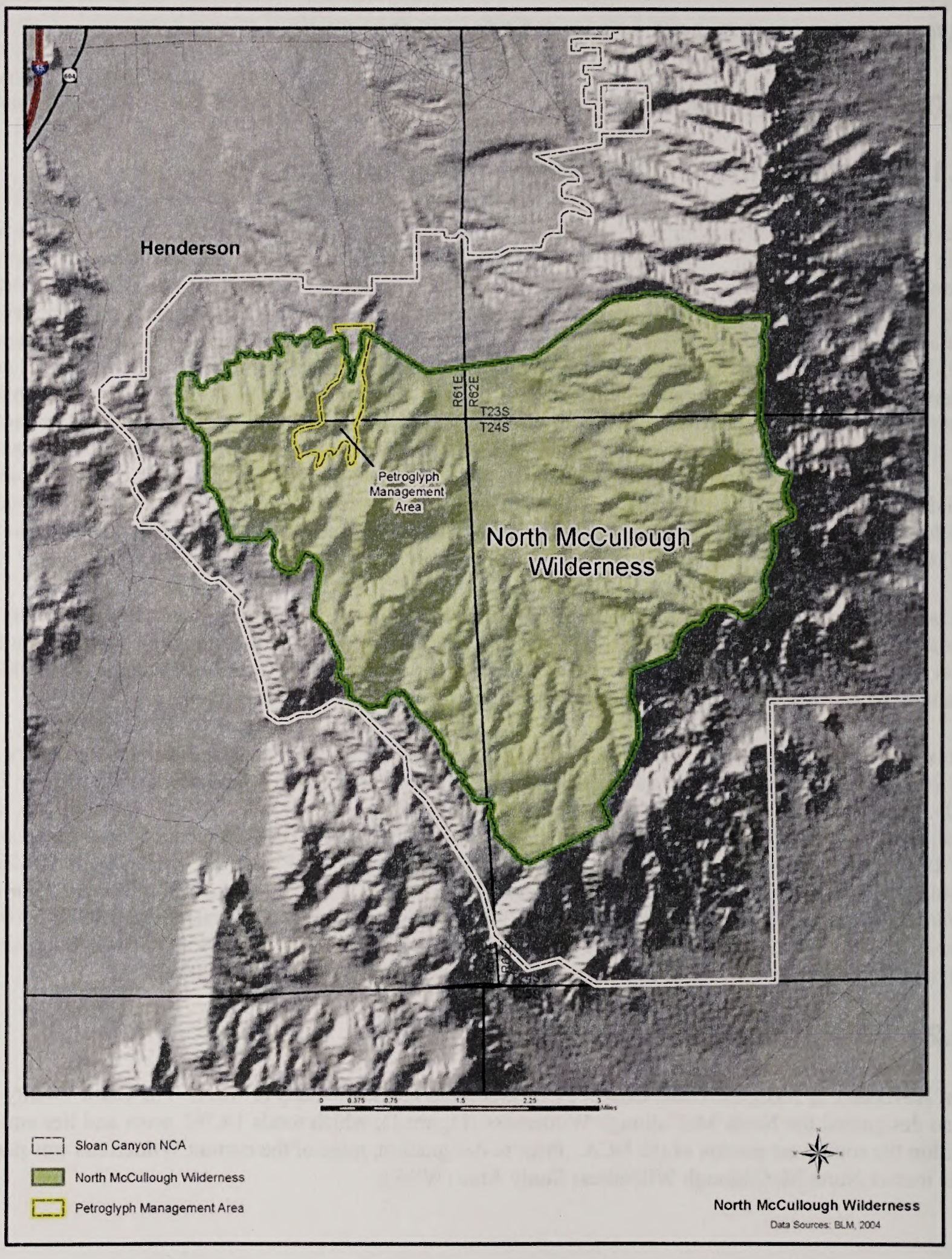
In addition to the approved management of the North McCullough Wilderness presented in this plan, the Sloan Canyon NCA Draft RMP/EIS provided a full description and analyses for four other alternatives that were considered but not selected as part of the proposed plan. The Record of Decision for the Sloan Canyon NCA RMP/Final EIS (FEIS) serves as the decision document for this plan.

This WMP is consistent with the Clark County Conservation of Public Lands and Natural Resources Act of 2002 (the Clark County Act); the Wilderness Act of 1964; Grazing Guidelines (House Report No. 101-405, Appendix A); and Wildlife Management Guidelines (House Report No. 101-405, Appendix B). It is also consistent with Code of Federal Regulation (CFR) 43 Part 6300; BLM Manuals 8560 (Management of Designated Wilderness Areas) and 8561 (Wilderness Management Plans); BLM Handbook H-8560-1 (Management of Designated Wilderness Areas); *Proposed Las Vegas Resource Management Plan and Final Environmental Impact Statement* (BLM 1998a); Memorandum of Understanding (MOU) between the BLM and the Nevada Department of Wildlife (NDOW) (BLM MOU 6300-NV930-0402, Supplement 9); and the *Clark County Multiple Species Habitat Conservation Plan* (CCDCP 2000).

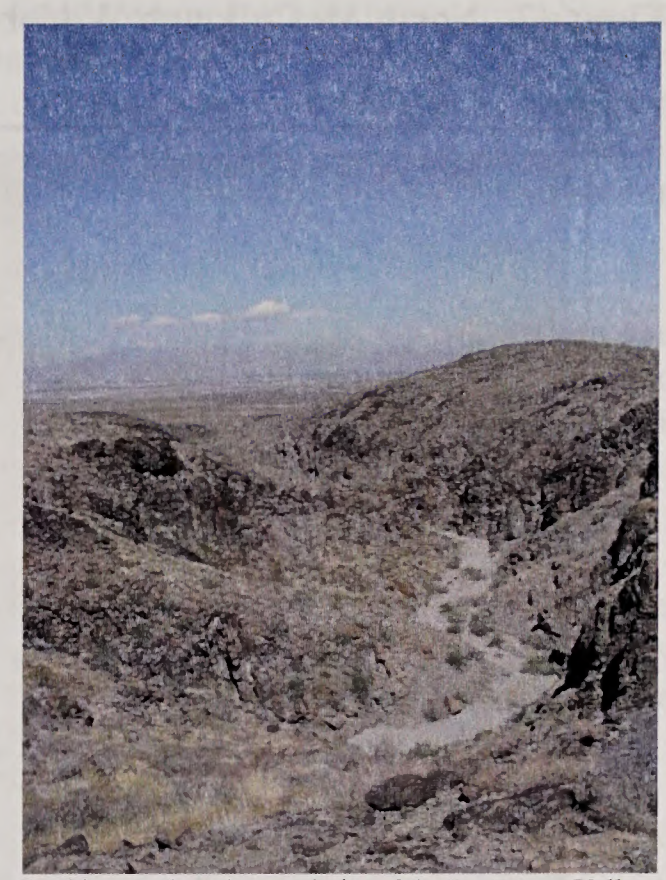
1.2 Wilderness Overview

On November 6, 2002, the Clark County Act established the Sloan Canyon NCA. The Clark County Act also designated the North McCullough Wilderness (Figure 1), which totals 14,765 acres and lies entirely within the southwest portion of the NCA. Prior to designation, most of the current Wilderness was part of the former North McCullough Wilderness Study Area (WSA).

Figure 1. North McCullough Wilderness



The North McCullough Wilderness is located to the south and immediately adjacent to the Las Vegas Valley in the north half of the north-south trending McCullough Range (Figure 2). It is roughly triangular in shape and spans approximately 6 miles at its longest and widest points. The eastern boundary follows the crest of the escarpment, the base of which forms the eastern edge of the NCA. The volcanic features that rim Hidden Valley define the western boundary. The northern boundary crosses Sutor Hills, Sloan Canyon and a large basin that contains the Sloan Canyon Petroglyph Site and other prominent features such as Sutor and Hanna Peaks. The massive, rounded to flat-topped volcanic peaks have a gradual western slope. The Wilderness interior is comprised of a broad two-mile wide central valley separating the main ridgeline to the east, from the rugged Sutor Hills. Elevations range from 2,850 feet at the lower end of the central valley to 5,058 feet at the ridgeline of the McCullough Range on the east side of the Wilderness. The North McCullough Wilderness is volcanic in origin and examples of lava flows, ash falls and glassy zones are clearly displayed in the Wilderness.



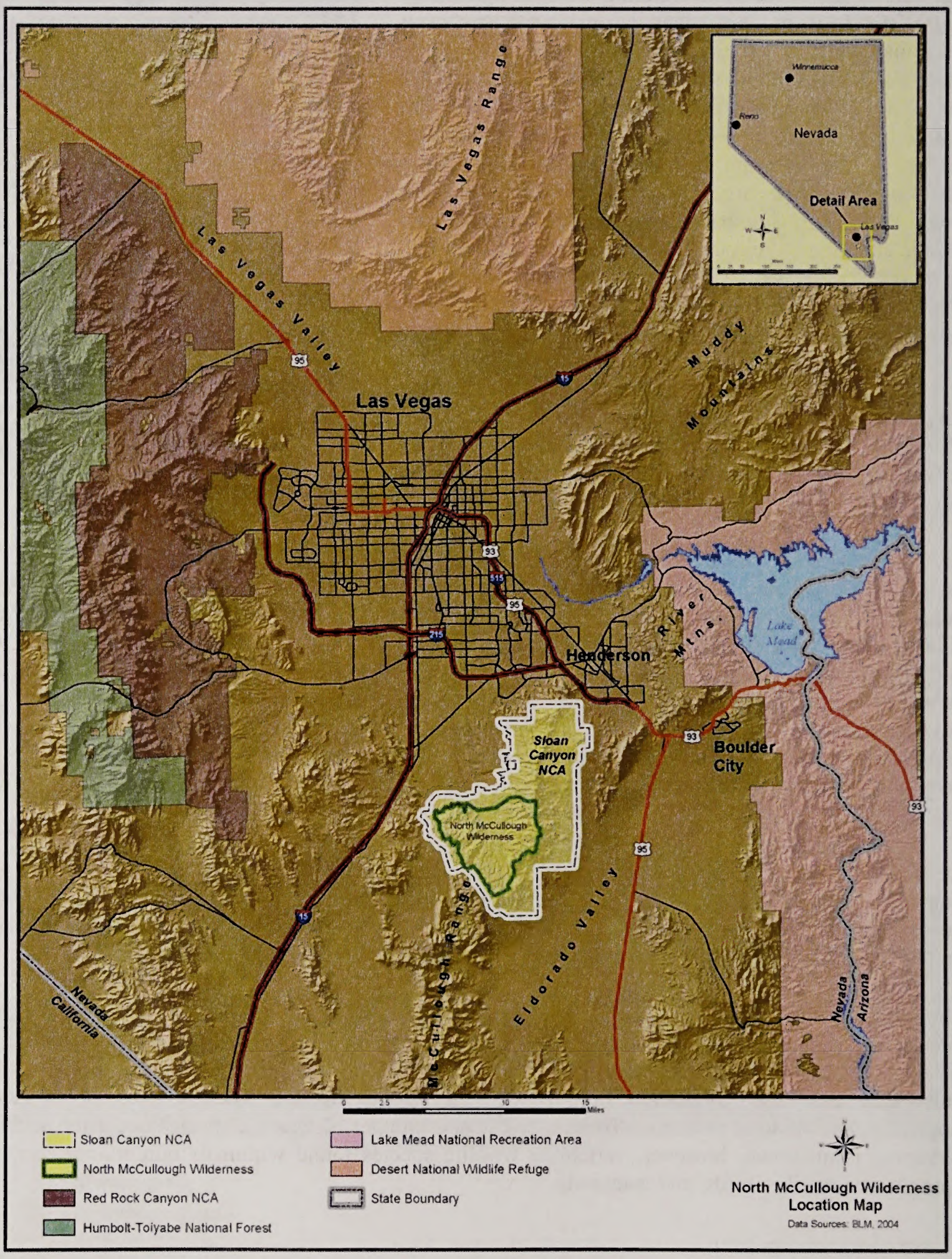
Looking north at the proximity of the Las Vegas Valley from the North McCullough Wilderness.

The North McCullough Wilderness consists of the Mojave Desert scrub vegetation community. This community is primarily composed of low, widely spaced shrubs, including the creosote bush (*Larrea tridentata*) and the white bursage (*Ambrosia dumosa*). Other affiliated community shrubs include ephedra (*Ephedra* spp.), brittlebrush (*Encleia virginensis*), burro bush (*Hymenoclea salsola*), bebbia (*Bebbia juncea*), and desert saltbrush (*Atriplex polycarpa*). Characteristic species associated with the Mojave Desert include Mojave yucca (*Yucca schidigera*), teddybear cholla (*Opuntia bigeloviai*), and hedgehog cacti (*Echinoceres* spp.). Black grama grass (*Bouteloua eriopoda)*, not known to occur elsewhere in Nevada, is found in the Wilderness. Short-lived annual and perennial wild flowers appear in late March, April, and May, and when prompted by winter rains.

Four vegetation associations are represented within the Sloan Canyon NCA and the Wilderness: (1) volcanic basalt slope association, (2) moderate creosote (greater than 30 percent cover), (3) sparse creosote/bursage mix, and (4) desert wash association (BLM 2004a). Detailed descriptions of the vegetation associations are included in Section 3.12 and Figure 3.10 of the Sloan Canyon RMP/EIS.

Although only one vegetation community, Mojave Desert scrub, is represented in the Wilderness, it supports a variety of wildlife species including desert bighorn sheep (*Ovis canadensis nelsoni*), Gila monster (*Heloderma suspectum cinctum*), and chuckwalla (*Sauromalus obesus*). The primary natural factors that influence populations and distribution of wildlife are water availability, vegetation, topography, and weather patterns. To date, the actual number of wildlife species occurring within the Wilderness is unknown; however, vertebrate wildlife species found within its borders represent three major classes: reptiles, birds, and mammals.

Figure 2. North McCullough Wilderness - Location Map



Wildlife Special Status Species include species federally listed as threatened and endangered, proposed for listing, or candidates for listing under the Endangered Species Act. They also include species

designated by each BLM State Director as sensitive and those listed, or proposed for listing, by a State in a category implying potential endangerment or extinction. Presently, the Mojave population of the desert tortoise (*Gopherus agassizii*) is listed as threatened and is the only federally protected species located in the NCA and potentially within the Wilderness (U.S. Fish and Wildlife Service 2003). A listing of Wildlife Special Status Species that may be found in the North McCullough Wilderness is presented in Table 3.6 of the Sloan Canyon RMP/EIS.

No natural perennial water sources exist within the Wilderness, but high-intensity thunderstorms can produce rapid runoff and flash flooding. Sloan Canyon hosts an ephemeral stream where water is found in the channel only during, and immediately after, rainstorms. The North McCullough Slickrock Catchment #1 (Project #4916) is the only wildlife water development (guzzler) within the Wilderness and was installed before Wilderness designation, while the area was a WSA.

Several manmade disturbances and developments exist within the North McCullough Wilderness. Approximately 3.75 miles of worn-in two-track vehicle routes, due to prior unauthorized off-highway vehicle (OHV) travel, can be found. A small rock and motor dam and a dug well are also present within the central valley of the Wilderness.

The currently low levels of recreation use within the North McCullough Wilderness is expected to increase with the rapid growth rate of the Las Vegas Valley and as information about recreational opportunities within the Wilderness and NCA becomes more available. Except for some recent monitoring of visitation to the Sloan Canyon Petroglyph Site, visitor use has not been closely monitored.

Generally the Wilderness receives low levels of dispersed recreational use primarily because of its rugged terrain and limited vehicle access to its boundary. There are opportunities for wildlife watching and permitted hunting in the Wilderness. Hiking and horseback riding opportunities abound within the Wilderness, with destinations frequently including Sutor and Hanna Peaks, North McCullough escarpment, and Sloan Canyon Petroglyph Site. Although opportunities for camping are possible, this form of recreation is not frequently pursued within the Wilderness.

The majority of recreationists use the Wilderness when they visit the Sloan Canyon Petroglyph Site, which is usually accessed from the north by way of the Sloan Canyon wash. Visitation to the Sloan Canyon Petroglyph Site increased following the designation of the NCA and Wilderness, with large parties, including organized hiking groups, frequenting the site. Based on limited monitoring in 2003-2004, preliminary visitor estimates indicate approximately 5 to 10 persons accessing the Sloan Canyon Petroglyph Site per weekday, with slightly higher visitation on weekend days.

Motorized access leading to the Wilderness is limited to several vehicle routes that approach from the northwest in the Sloan Canyon area and the southwest from Hidden Valley. These routes access Sloan Canyon and the wash leading to the Sloan Canyon Petroglyph Site. Other access to the Wilderness boundary is by off-trail hiking or horseback riding as there are no formal trails, trailheads, or associated developments adjacent to or within the Wilderness. For the most part, the rugged and rocky terrain discourages unauthorized vehicular access into the Wilderness. A small amount of unauthorized motorized use of the Wilderness has occurred at the Hidden Valley side near the southern access to the Sloan Canyon Petroglyph Site.

No areas of high mineral resource potential have been identified in the Wilderness. There are no mineral leases and only portions of three current, but undeveloped, claims intruding slightly into the northwest portion of the North McCullough Wilderness. The validity of the claims have not been determined.

Low-level aircraft flights occur over the Wilderness. The highest percentage of low-level overflights is from scenic tours originating from local area airports, although private flights from Henderson Executive Airport, located several miles from the northern Wilderness boundary, also contribute. In addition, commercial flights from McCarran International Airport pass directly over the Wilderness, although they tend to be localized to the western edge and at an altitude of more than 4,000 feet. Legislation currently before Congress proposes a future heliport located west of the NCA and mandates a two-mile wide helicopter flight corridor over the Wilderness. The legislation would allow helicopter overflights at elevations between 500 and 1000 feet above ground, over the Wilderness. As proposed, approximately 90 round-trip overflights a day, equating to a flight about every four minutes, will emanate from the heliport.

The Hidden Valley Allotment is currently open to livestock grazing. A portion of this ephemeral allotment lies within the North McCullough Wilderness but, because of the rugged terrain and lack of water, cattle typically do not wander into the Wilderness. Within this portion of the allotment there are no developments associated with livestock grazing.

Wildfires in the vicinity of the North McCullough Wilderness generally occur in the summer but are not uncommon in the spring, and occasionally occur in the late fall months. Within the Wilderness, there are few recent wildfire occurrences. This lack of wildfire is due to the sparseness and low stature of the shrub vegetation. Even in years with an ephemeral buildup of non-native annual grasses, the rockiness of the terrain and discontinuity of the fuel bed minimizes the risk of wildfire spread.

1.3 Wilderness Characteristics

The quality of the wilderness values were a key consideration in designating the North McCullough Wilderness. The Wilderness generally appears natural, but there are a few signs (e.g., disturbances, developments) of human use introduced into the environment prior to the area's designation. These include two-track vehicle routes, rock and motor dam, dug well, and a wildlife water development (guzzler).



Despite its proximity to a largely populated urban area, the portion of the Wilderness outside the Petroglyph Management Area possesses good solitude opportunities due to the historically low levels of visitor use; lack of trails and other developments; and topography that provide some natural screening from the adjacent urban area or other wilderness users. A lesser degree of solitude is available within the Petroglyph Management Area as this area has the heaviest visitation within the Wilderness. The primeval character of the entire Wilderness is essentially intact except for the occurrence of some introduced plants, primarily annual grasses.

Opportunities for a primitive and unconfined form of recreation close to a rapidly growing urban area abound. Diverse non-developed recreational opportunities such as hiking/backpacking, rock scrambling, nature study, photography, horseback riding, hunting, and general exploration can be easily pursued throughout the Wilderness.

2.0 NATIONAL WILDERNESS MANAGEMENT GOALS

The following goals direct the objectives, policy, management strategies and actions developed in this plan.

- To provide for the long-term protection and preservation of the area's wilderness character under a principle of non-degradation. The area's natural condition, opportunities for solitude, opportunities for primitive and unconfined types of recreation and any ecological, geological, or other features of scientific, educational, scenic, or historical value present will be managed so that they will remain unimpaired.

- To manage the wilderness area for the use and enjoyment of visitors in a manner that will leave the area unimpaired for future use and enjoyment as wilderness. The wilderness resource will be dominant in all management decisions where a choice must be made between preservation of wilderness character and visitor use.

- To manage the area using the minimum tool, equipment, or structure necessary to successfully, safely, and economically accomplish the objective. The chosen tool, equipment, or structure should be the one that least degrades wilderness values temporarily or permanently. Management will seek to preserve spontaneity of use and as much freedom from regulations as possible.

- To manage nonconforming but accepted uses permitted by the Wilderness Act and subsequent laws in a manner that will prevent unnecessary or undue degradation of the area's wilderness character. Nonconforming uses are the exception rather than the rule; therefore, emphasis is placed on maintaining wilderness character.

2.1 Wilderness Specific Issues

Issues to be addressed in this plan were identified by BLM specialists, other agencies, and the public during the scoping period for the Sloan Canyon NCA RMP/EIS. Most issues identified by the public also included a preference for management. Although the preferences were used in developing a range of alternatives, the following is only a listing of the issues:

- How will the appropriate level of use for the North McCullough Wilderness be determined?
- What types of ongoing visitor use monitoring will be addressed in the plan?
- How will the appropriate level of signage for the Wilderness be determined?
- How will seasons of use for the Wilderness be addressed?
- How will a Limits of Acceptable Change (LAC) process be incorporated into the development of the North McCullough WMP?
- How will visitor information collection systems be applied to Wilderness and used to manage Wilderness recreation?
- How will rehabilitation of ways within the Wilderness be addressed?
- How would interpretation attract visitation to the Wilderness? How would increased visitation lead to inappropriate permanent human presence and uses that impact wilderness values?
- How will trail use and development in Wilderness be addressed?

- How will the establishment of new rock climbing routes be addressed?
- How will wildlife habitat in the Wilderness be managed?
- How will the proximity of urban areas to the NCA and Wilderness be addressed to ensure appropriate access and protection of resources?

2.2 Issues Not Addressed in this Plan

Several issues identified during scoping are already addressed in other planning documents, solved through policy or administrative action, or are considered to be outside the scope of this WMP. Presented below is a list of the issues, along with a statement as to why each is not addressed in this plan.

- How will aerial tours of the area be addressed for the Wilderness?

  The BLM does not have jurisdiction over the airspace above the North McCullough Wilderness. The use of aircraft is only regulated by the BLM if they land or if anything or anyone is picked up or dropped by means of an aircraft.

- How will the WMP be embedded in the overall management plan to ensure that it is recognizable and consistent with plans for other wilderness areas in the region?

  The North McCullough WMP has been incorporated into the Sloan Canyon NCA Proposed (PRMP)/FEIS as an appendix and included as an attachment to the Record of Decision. It has been developed in accordance with BLM Manual 8561, Wilderness Management Plans, which provided policy and guidance for its preparation. National Environmental Policy Act requirements have been satisfied through the PRMP and Draft RMP/EIS that provide a full description and analyses for the preferred alternative as well as three other alternatives that were considered but not selected. The Record of Decision for the Sloan Canyon NCA PRMP serves as the decision document for this plan.

- How will the coordination of volunteer groups be incorporated into Wilderness management?

  The BLM has an established volunteer program which includes utilizing volunteers for Wilderness monitoring and projects. Volunteers under BLM direction may assist in implementing the plan however, the decision to do so is not required through this WMP.

- How will the appropriate herd size for bighorn sheep in the Wilderness be determined in the plan?

  The management of wildlife within the State of Nevada is the responsibility of the NDOW. BLM is responsible for management of wildlife habitat on BLM administered lands. Appropriate herd size for the North McCullough Wilderness and the McCullough Mountains was published in the *Rangewide Plan for Managing Habitat of Desert Bighorn Sheep on Public Lands* (BLM 1998b).

  NDOW and the BLM continue to cooperatively manage the population and its habitat in accordance with this document and other planning documents including habitat management plans.

- How will trespass in the Wilderness be addressed?

  Actions designed to help in the prevention of unauthorized activities (trespass), as well as, the rehabilitation measures to be undertaken in the event of an unauthorized activity are presented in this WMP. Enforcement of wilderness regulations and detection of violators, however, is not

addressed in this plan as they are provided for in existing law, regulation and policy including penalties provided for at 43 CFR 6302.30.

- How will recreation use of the NCA be managed to balance the spectrum of recreation intensity between the Wilderness and NCA, outside the Wilderness?

  The WMP addresses several actions designed to prevent recreational activities allowed within the NCA from impacting on the North McCullough Wilderness, where those same activities are not allowed. The actual management of recreational use within the NCA, and how its intensity will be balanced between the NCA and the Wilderness is addressed within the Sloan Canyon RMP.

- How will BLM Law Enforcement and Wilderness Rangers be used to manage wilderness?

  The hiring and use of both Law Enforcement and Wilderness Rangers (non-law enforcement) is an administrative action not requiring a decision through this WMP. Wilderness Rangers are the first line contact with wilderness and backcountry users; and are responsible for monitoring (see Section 5.0) for a variety of potential unauthorized incursions into the Wilderness. All regulations will be enforced by BLM Law Enforcement Agents and Law Enforcement Rangers. Violators will be detected through periodic patrol and investigative follow-up to reports by the public, BLM and other agency employees. Any prohibited acts defined at 43 CFR 6302.20, outside of those authorized in this plan, are subject to the penalties provided for at 43 CFR 6302.30.

2.3 Wilderness Management Objectives

Objectives, under the National Wilderness Management Goals presented earlier (Section 2.0), were developed to address the management of, and the issues identified for, the North McCullough Wilderness. These objectives are not listed in any order of priority.

- Maintain or improve solitude within the Wilderness.
- Maintain or improve naturalness in the Wilderness to achieve a standard of no known surface disturbances and stable or decreasing non-native plant populations.
- Provide a diversity of opportunities for primitive and unconfined recreation.

2.4 Current Situation and Assumptions

In order to appropriately develop the various management actions necessary to meet the plan objectives, the existing situation and anticipated changes that can reasonably be expected to take place over the life of this plan are considered first. Inventory, monitoring, and research will be an important component to meeting the objectives of the plan.

It is anticipated that current daily visitation to the North McCullough Wilderness would increase in the area near Petroglyph Management Area to numbers requiring guided tours and permitted access. This area has historically witnessed a majority of the visitation to the area now designated as Wilderness. Continuation of this pattern of use is anticipated to continue in the future. For the remainder of the Wilderness, it is anticipated that the current sporadic visitation would moderately increase to daily visitation primarily on weekends during the spring and fall. Lesser visitation is anticipated during the extremes of the winter and particularly summer months. Management of the various visitor uses may be required in order to preserve the future use and enjoyment of the area.

- The population and associated development in the Las Vegas Valley will continue to grow, particularly in the area immediately adjacent to the NCA and the northern and western boundary of the Wilderness. The resultant population within a one-mile distance is anticipated to focus increased attention on the Wilderness.

- Currently, unauthorized vehicular access to the North McCullough Wilderness boundary is primarily at two locations, the north end of Sloan Canyon and on the west at Hidden Valley. Both of these locations are usually used to access the Sloan Canyon Petroglyph Site. It is anticipated that infrastructure (e.g., housing) growth in the Las Vegas Valley, and in particular that of the City of Henderson up to the NCA boundary, could result in management issues concerning vehicular access to the NCA and interior Wilderness.

- Now that the area has been designated, visitors formerly unfamiliar with the area may learn about the North McCullough Wilderness from not only maps provided by the BLM but also websites; newspaper and magazine articles; and guidebooks from various sources. For the most part these visitors may be interested in recreation opportunities not involving the use of motor vehicles. They are looking for new opportunities or areas that are less crowded. The fact that this is a desert wilderness with its associated desert characteristics (e.g., extreme temperature and lack of water) is expected to influence interest in the area and somewhat limit visitation.

- It is anticipated that hiking/backpacking, rock scrambling, nature study, photography, horseback riding, permitted hunting, and general exploration will continue to be the primary recreational activities pursued within the Wilderness.

- As with many of the wilderness areas in southern Nevada, interest in and the potential for guiding services is low within the North McCullough Wilderness. This is not expected to change appreciably over the foreseeable future.

In order to maintain the natural appearance, including the visual landscape and the soundscape, of the North McCullough Wilderness, some limited management actions will be necessary.

- The surrounding NCA provides added protection to the Wilderness from potential unauthorized OHV intrusions. The northern, southern and western boundaries of the Wilderness, however, are near areas currently being used for unauthorized OHV recreation. Management will need to recognize that there still remains a potential for unauthorized OHV incursions within the Wilderness at these locations.

- The Wilderness will be affected not only by increased visitation to the Sloan Canyon Petroglyph Site, but also by external urban sounds from the adjacent community, and the sight of power lines and mountaintop radio repeater facilities.

- Aircraft overflights of the area are currently infrequent and usually at high elevations. However, two new airport development proposals exist that could greatly degrade solitude of the area: 1) a heliport near the northwest corner of the Wilderness would cause sight-seeing helicopter overflights every few minutes; 2) the construction of a cargo/passenger airport between Primm and Jean, Nevada, could cause additional, lower level commercial overflights, depending on takeoff and landing flight paths.

- A limited number of surface disturbances and developments can be found within the North McCullough Wilderness. Where appropriate, they will require management action to remove and/or rehabilitate them.

It is anticipated that the preservation of the primeval character and influence of the natural resources of the Wilderness will require minimal management actions.

- Other than a potential for Sahara mustard and tamarisk, noxious weeds are not known to occur in the Wilderness. New introductions of noxious weeds are possible and need to be addressed early to prevent infestation. Red brome and Russian thistle are exotic invasive weeds. These species are widespread and eradication is currently not possible, although management actions to reduce surface disturbance can help prevent it from dominating the ecosystem. Should effective eradication methods be identified in the future, they would be analyzed to determine their impact on the overall environment and utilized where appropriate.

- Within the boundary of the Wilderness, there are few recent wildfire occurrences. Because the vegetation in the Wilderness is not fire-adapted, fire has the potential to convert areas from native species dominance to dominance by non-native introduced species.

- There is minimal natural surface water within the Wilderness. The only natural occurring surface water sources are ephemeral in nature, resulting from infrequent thunderstorms and subsequent runoff. There is one wildlife water development (guzzler) emplaced prior to the Wilderness designation, but it is well hidden and not readily visible.

- Non-BLM initiated inventory, monitoring, or research projects will be periodically proposed within the Wilderness. It is anticipated that most of these proposals will add to the understanding of the wilderness resource and help to improve wilderness management. All proposals will need to be reviewed before approval to assure the work is compatible with preservation of the wilderness resource and is not more suitable for areas outside of the Wilderness.

3.0 MANAGEMENT STRATEGY

The strategy of the North McCullough WMP is to maintain or improve the natural character of the Wilderness by protecting many of the near-pristine conditions while rehabilitating existing human impacts. The strategy recognizes that as the cities of Las Vegas and Henderson expand their boundaries and populations in the coming years, the Wilderness will be subject to increases in visitor use and its associated consequences. The Wilderness will be managed in a manner that protects the qualities of wilderness character consistent with appropriate levels of public use. Wilderness characteristics will be maintained through standards and/or limitations established through this plan. Separate standards and/or limitations will be established for the highly-visited Petroglyph Management Area and the remainder of the Wilderness. This WMP emphasizes monitoring and the ability of managers to take corrective actions, if necessary.

The North McCullough Wilderness provides wilderness experiences for a wide range of the public. Consequently, the Petroglyph Management Area, as well as its northern and southern access trails, will be managed as a more concentrated use area. This concentrated use area (351 acres) constitutes about 2 percent of the 14,765-acre Wilderness. The Sloan Canyon Petroglyph Site has been an important destination, prehistorically and historically, and it will likely see more visitation as the NCA is developed and the surrounding population increases. BLM believes that visiting the Sloan Canyon Petroglyph Site is a rare and unique opportunity for the American public, and that the visitor experience at this site furthers the goals of Wilderness by generating an understanding and appreciation of cultural resources. BLM is committed to managing the Petroglyph Management Area intensively to prevent the degradation of natural and cultural resources that could result from visitor use. The remaining Wilderness, following minimal rehabilitation, will be managed to maintain its current condition and prevent gradual impacts to pristine areas.

A challenge of wilderness management is meeting public demand for its use while protecting wilderness values such as ecological integrity and solitude. This plan attempts to find an acceptable level of impacts and to assess the trade-offs of resource protection, visitor freedom, and wilderness values. BLM is aware that each visitor holds a personal set of expectations of and assumptions on what a wilderness experience is or should be, and believe that most everyone's desired experience can be provided across the Wilderness with this management strategy. However, it is recognized that at times peak public demand will not be met (e.g. limitation of access to the Wilderness) to avoid the risk of unacceptable impacts on wilderness values.

3.1 The Petroglyph Management Area and Access

Visitors will have the greatest possibility of encountering others in this portion of the Wilderness. Access by designated trails and trailheads will be required, as will guided tours during periods of high use such as weekends and holidays. During periods of lower use (e.g., weekdays), visitors may go to the Petroglyph Management Area unaccompanied by a BLM-sponsored guide, if they obtain a permit. The sights and sounds of human activity will be common. Some risk and challenge will be encountered, but route finding will be easy with the aid of trails. The natural setting may be minimally modified in accommodating access to the site, but in a manner that protects natural resources and presents minimal visual impact. Management decisions will support healthy, viable, and naturally distributed wildlife and plant populations.

Directional signs may be provided. No equestrian or pack animal use will be allowed in the Petroglyph Management Area or the northern access trails, but it will be allowed on the Hidden Valley Trail south of the Petroglyph Management Area (Figure 3). Packed in and certified weed-free feed will be required for animals used for recreational riding or pack stock. No camping, rock climbing, geocaching, rockhounding or dogs are allowed within the Petroglyph Management Area.

3.2 Remainder of the North McCullough Wilderness

This area includes the portion of the North McCullough Wilderness outside the Petroglyph Management Area and its north and south access trails. At this time, except for the area where hiking is limited to proposed trails developed in the future (Figure 4), access to this portion of the Wilderness will be available for cross-country hiking from the boundary of the NCA or from a limited number of access roads. In the event of the establishment of social trails (foot worn hiking paths), occasional management activity may be necessary to protect and/or rehabilitate resources. Unwanted trails and sites may be actively rehabilitated by management or allowed to recover naturally. In the event that a social trail is desired for retention, management actions necessary to bring it up to BLM standards may be undertaken. No directional signs will be placed in this portion of the Wilderness. Cross country equestrian and pack animal use will be allowed. Packed in and certified weed-free feed will be required for animals used for recreational riding or pack stock. Rock climbing will be allowed but the use of permanent anchors will be prohibited. Camping will be allowed but within the limitations and standards specified in this plan. Geocaching and rockhounding is prohibited throughout the Wilderness. Dogs are also prohibited in the Wilderness. Management decisions will support healthy, viable, and naturally distributed wildlife and plant populations.

The following site-specific actions will be implemented at the North McCullough Wilderness. These actions meet the wilderness management objectives and respond to those Wilderness specific issues which were identified through the RMP process. All actions are supplemental to and consistent with Wilderness laws, regulations, and policies, which must further be consulted in the event of future unforeseen issues.

Figure 3. Petroglyph Management Area

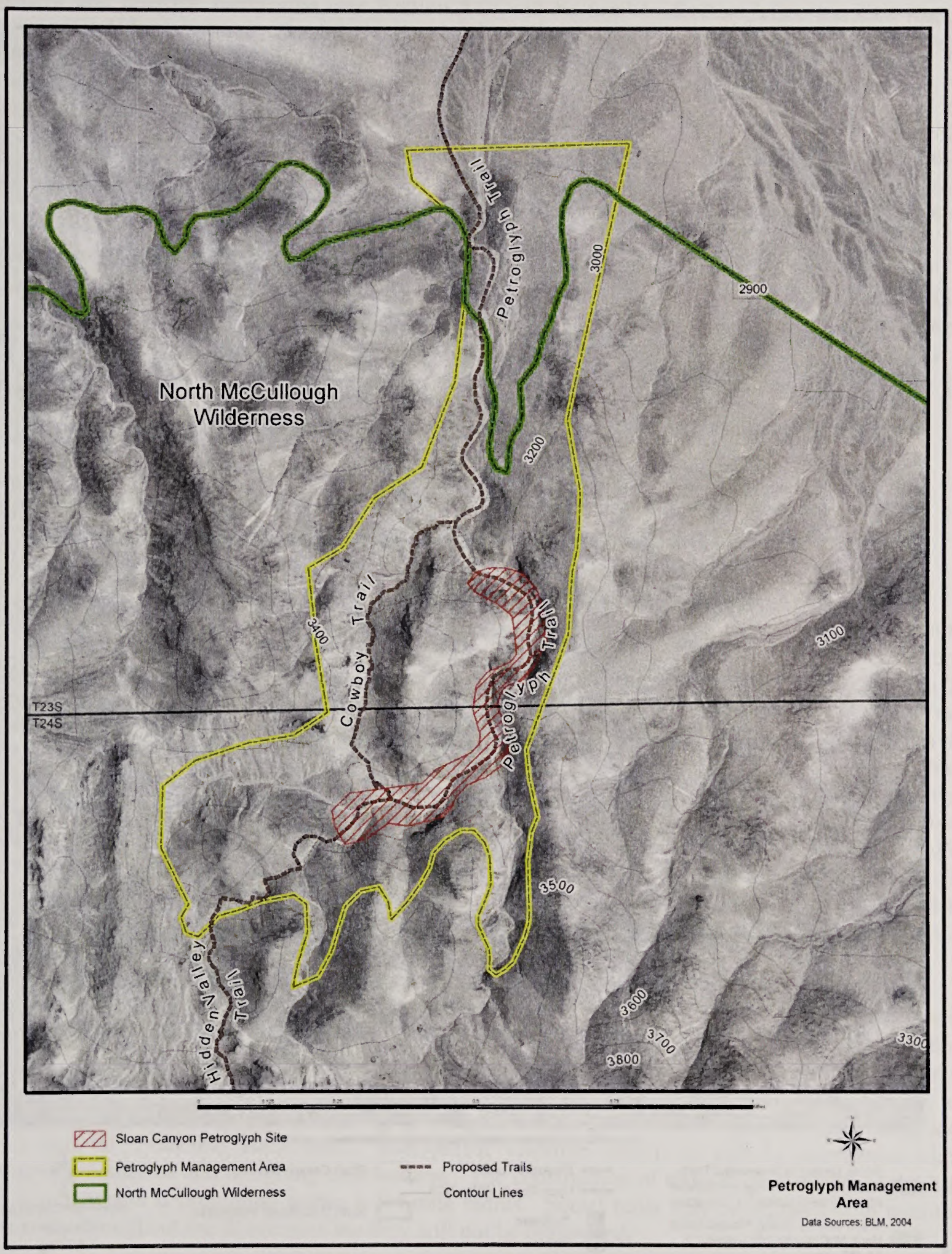
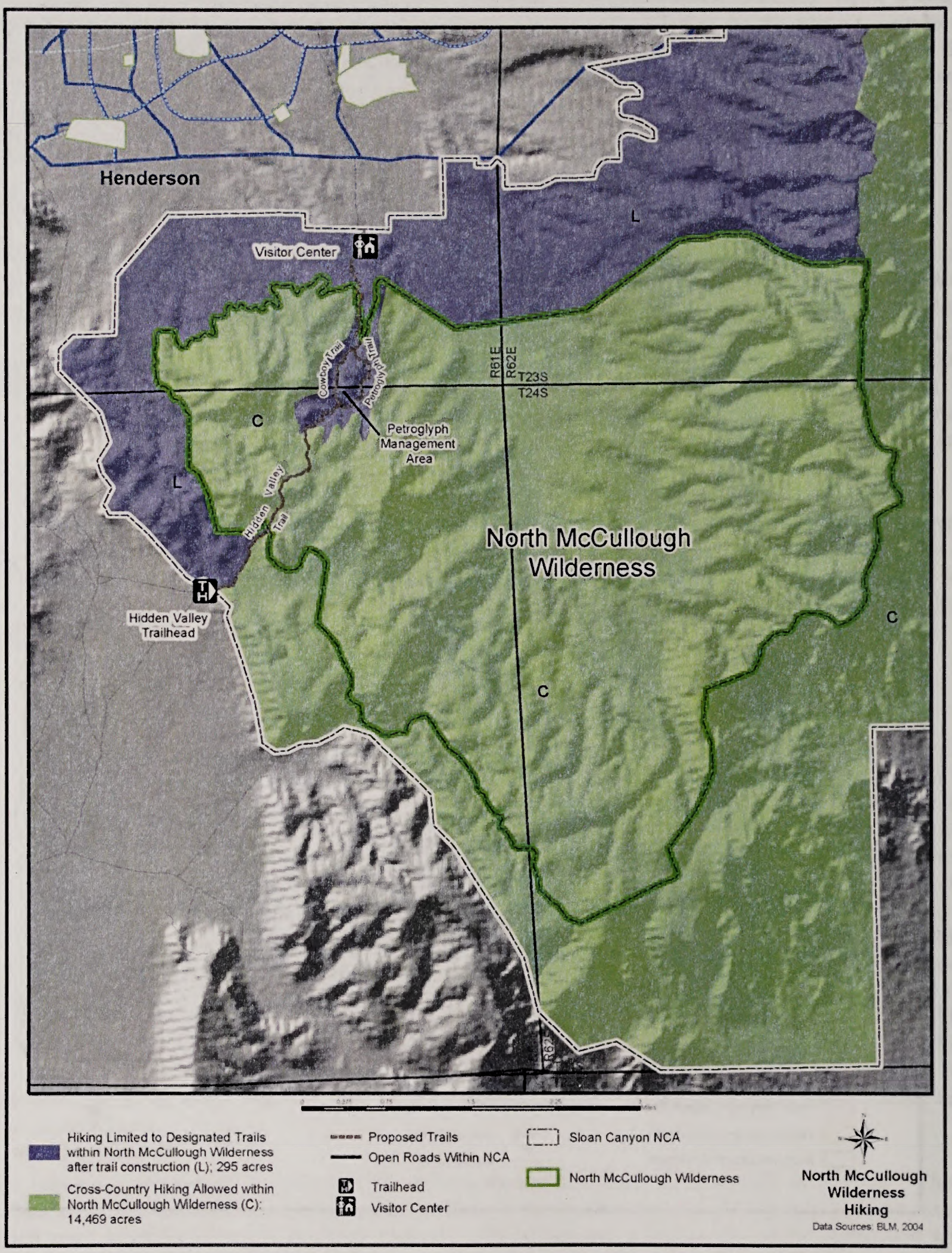


Figure 4. North McCullough Wilderness Hiking



Because demands on the Wilderness and surrounding NCA will likely increase over the coming years, the Plan contains flexible management guidance, which will be refined based on use and resource monitoring. Visitation and resource monitoring (see Section 5.0) will be used to further define baseline resource conditions and document any changes to them. Once additional resource baseline data is acquired, a system such as LAC will be used to refine limits and standards for future actions.

The concepts outlined in the LAC System for Wilderness planning (Stankey et al. 1985) or succeeding professional standards will be used. The LAC emphasizes a framework for establishing acceptable, appropriate, and measurable resource and social conditions in Wilderness. Its process focuses on desired conditions, defines what is and is not acceptable, and develops a strategy to prevent unacceptable conditions.

Once residential development on the western side of the NCA is complete, the Wilderness and the Sloan Canyon Petroglyph Site will be just a short distance from a large urban population. To manage the potential increase in visitation, to protect the sensitive cultural and natural resources, and to protect wilderness characteristics, detailed management actions were developed.

4.0 WILDERNESS MANAGEMENT ACTIONS

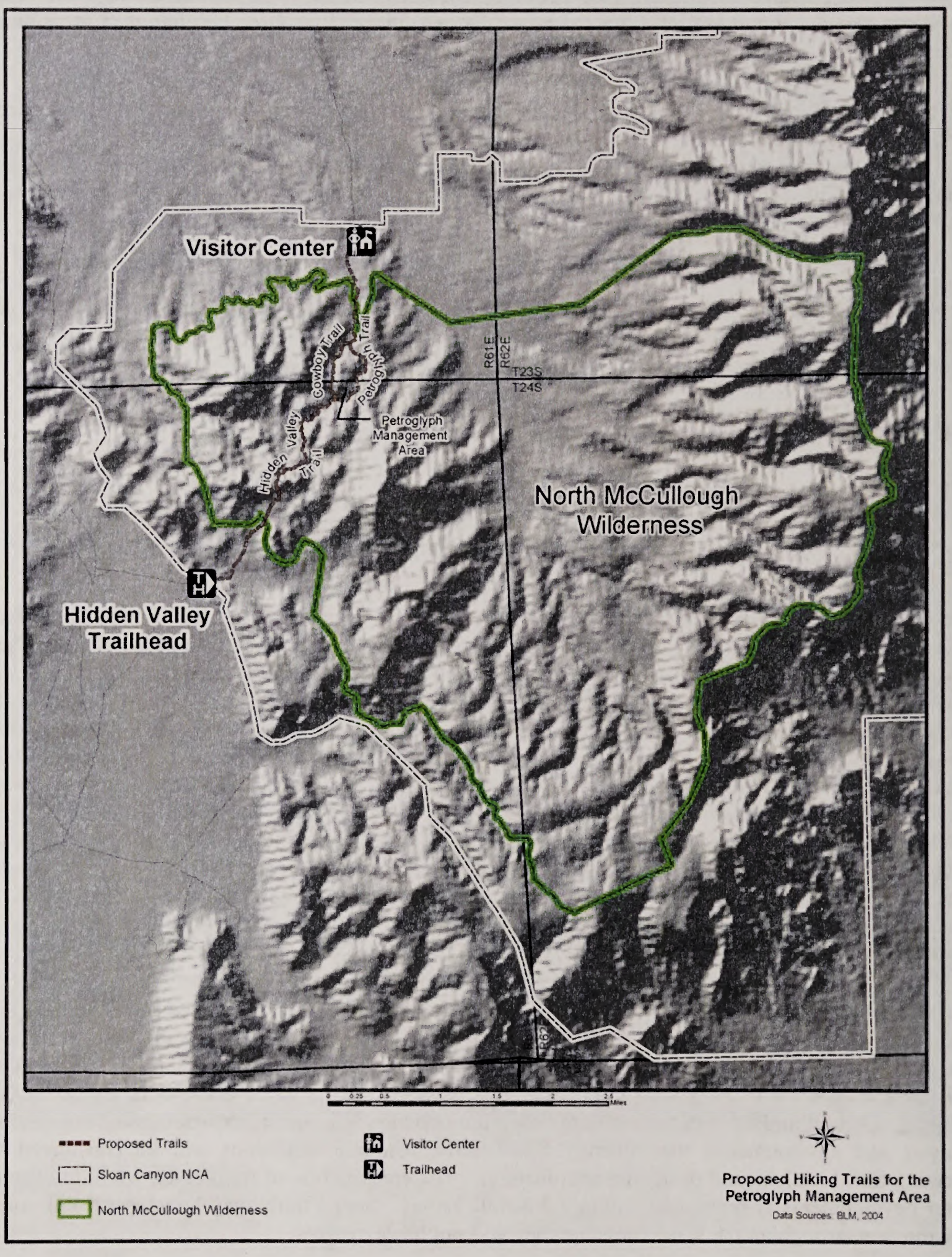
4.1 Trails Management

4.1.1 Construction and/or Designation of Approximately 3 Miles of Trail

Access to and use of the Petroglyph Management Area will be confined to the canyon bottom and a limited number of proposed trails designed to provide for flexibility in visitor needs and resource protection. Two trails that access the Sloan Canyon Petroglyph Site, one from the north and one from the south will be constructed and designated (Figure 5). A 1.38 mile long portion of Hidden Valley Trail, emanating from the Hidden Valley Trailhead, will be constructed and will direct visitors away from the existing wildlife water development (guzzler). Within the Wilderness the 0.86 mile long "Cowboy" Trail, emanating from the Petroglyph Trail on the north end of Sloan Canyon, will be constructed to provide an alternative to the Petroglyph Trail. The 0.7 mile portion of the Petroglyph Trail that is in the Wilderness will be designated, but because it is located entirely within the wash bottom of Sloan Canyon, it requires limited construction. Because of major obstructions along the Petroglyph Trail, the Cowboy Trail will provide a more negotiable and safer alternative means of access to the Sloan Canyon Petroglyph Site. Use of the Cowboy Trail eliminates the need for placement of structures designed to negotiate the rock obstructions along the Petroglyph Trail.

In the future, if deemed necessary for the enhancement of Wilderness, trails may be added within the area where hiking is limited to designated trails (Figure 4) provided the design and construction of a new trail will not cause impacts to sensitive cultural, natural resources, and/or wilderness character. This minimal trail development will be allowed only for the purposes of resource protection, enhancement of wilderness values and erosion control, and only after conducting a minimum requirement/minimum tool analysis and environmental assessment. Site-specific resource conditions will be considered when selecting trail locations and designing trail features. The construction of trails in the vicinity of wildlife water developments is prohibited within a 1/4-mile radius. Social trails may be adopted with minimal construction throughout the Wilderness but they will not be designated.

Figure 5. Designated Hiking Trails for the Petroglyph Management Area



All constructed trails will meet established trail standards as presented in BLM Manual 9114, BLM Handbook H-9114-1, and BLM Handbook H-8560-1. Trails must not be constructed with treads of more than 24 inches in width except where a wider (not more than 48 inches) trail is justified to protect the wilderness resource and/or provide for visitor safety. Trails must follow natural contours where possible and result in minimum disturbance to soil and ground cover. Maintenance will strive to limit trail width to the 24 inches and not to exceed 36 inches except where necessary for safety or sections in washes. Trail sections constructed in excess of 24 inches will be maintained at no more than 18 inches of its original width.

4.1.2 Social Trail Management

Outside the area of the Petroglyph Management Area, cross-country travel by foot and horseback riding will be allowed (Figures 4 and 8). This may result in the creation of social trails leading to the more desirable destinations within the Wilderness. Although creation of social trails will be discouraged, Sutor and Hanna Peaks are two locations that may attract the establishment of such trails. Although these worn-in trails would not be shown on BLM maps or brochures, once they are discovered by visitors to the area they may see continued use.

To date, most travel has utilized the numerous dry washes or rocky areas throughout the Wilderness and as a result, no known social trails have been documented. Through ongoing monitoring and review of published route descriptions, an inventory of future social trails occurring outside of the dry washes, will be maintained. Once trails are discovered, they will be evaluated to determine the impact to cultural, natural resources, and Wilderness character, as well as, the objectives of this plan.

If found to be feasible, trails resulting in unacceptable impact to the wilderness and not desired for future designation, modification, or use will be rehabilitated following the guidelines as presented later in Section 4.3. In the event that a social trail is retained, problem sections only may be rerouted, improved or maintained in order to correct an unstable situation or adverse impacts resulting from the trail but not to make the trail easier to travel or encourage its use. This would include situations where slopes are in excess of 15%, which presents the potential for excessive surface erosion and where trail deterioration is high; and trail braiding either exists or is beginning. Maintenance will strive to limit trail width to 24 inches, and not exceed 36 inches except where necessary for safety or sections in washes. The completion of a minimum requirement/minimum tool analysis and environmental assessment is required prior to any trail work.

4.2 Wilderness Visitation

The main access to the Petroglyph Management Area will be controlled through a Visitor Center located near the NCA boundary at the northern end of the Sloan Canyon wash, outside the North McCullough Wilderness. Rangers, BLM staff, and/or volunteer site stewards will patrol the Petroglyph Management Area for visitors entering from points other than the Visitor Center and will either deny access based on visitation levels or issue a self-guided tour permit. Use of the Petroglyph Management Area will be limited to the



A visitor to the wilderness (hiker)

Visitor Center's operational hours, which will be determined by BLM before the center is opened.

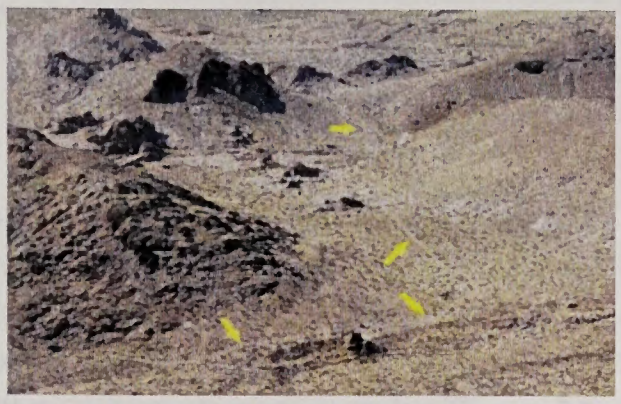
The Petroglyph Management Area, although a small portion of the North McCullough Wilderness, receives an estimated 90% of the visitation to the Wilderness. Opportunities for solitude, although occasionally good during low use periods, are generally low within the Petroglyph Management Area. Considering the amount of use within the canyon and in order to protect the special features of the area, limitations on visitor use have been established. Visitors to the Petroglyph Management Area during periods of high use such as weekends and holidays must join a BLM-sponsored guided tour. No more than one guided group, of no more than 20 people, will be allowed in the Petroglyph Management Area at one time. With prior reservations, organized groups of 10 to 35 people will be allowed to visit the Petroglyph Management Area accompanied by BLM-sponsored guides. During periods of lower use (e.g., weekdays), visitors may go to the Petroglyph Management Area unaccompanied by a BLM-sponsored guide, if they obtain a permit. Self-guided tour permits will be issued from the Visitor Center at the north entrance to Sloan Canyon, the Hidden Valley Trailhead at the south entrance, or from a roving ranger. No more than 25 permits per hour will be issued for self-guided tours. While seeking to protect the special features (e.g., cultural resources) of the area, its unconfined character may be somewhat diminished. Resource baselines will be refined through continued monitoring (visitation and resources will be monitored in accordance with Section 5.0 of this plan). Within four years of the completion of visitor facilities (e.g. Visitor Center, Hidden Valley Trailhead, and Sloan Canyon north and south access trails), a system such as LAC will be used to establish indicators and standards for future actions. Following establishment of these standards limitations on the number of individuals, number of groups and/or group size may be adjusted.

For the portion of the North McCullough Wilderness outside the Petroglyph Management Area and the hiking area limited to designated trails (Figure 4), visitors will have good primitive and unconfined recreational opportunities. Except for the vicinity of the north and south access trails into the Petroglyph Management Area, visitors will realize good solitude opportunities as they traverse the Wilderness cross-country. Unlike Sloan Canyon, encounters with other individuals or groups will be infrequent. As would be expected in an area immediately adjacent to an urban population, outside sights and sounds will be encountered during most trips. Within this portion of the Wilderness, the standard for visitor group encounters (visitors traveling within sight or sound of one another) more than one-half mile from the wilderness boundary and one-quarter mile from the Cowboy, Petroglyph, and Hidden Valley Trails is set at no more than five encounters per day exceeded on no more than four days per year. As with the Petroglyph Management Area, resource baselines will be refined through continued monitoring (visitation and resources will be monitored in accordance with Section 5.0 of this plan). Within four years of the completion of visitor facilities (e.g., Visitor Center, Hidden Valley Trailhead, and the Petroglyph Management Area north and south access trails), a system such as LAC will be used to reevaluate and if necessary establish new thresholds for future actions. Following this process, visitor encounter standards may be adjusted or limits imposed.

4.3 Disturbance Rehabilitation

Throughout the North McCullough Wilderness, existing disturbances and developments, as identified in Table 1 and Figure 6, will be rehabilitated within four years of the Sloan Canyon NCA Approved RMP/FEIS Record of Decision using appropriate methods determined through a minimum requirement/minimum tool analysis for each project. Approximately 3.75 miles (2.93 acres) of two-track vehicle routes and 244 square yards (0.05 acres) of disturbance associated with a rock and motor dam and dug well will be rehabilitated. Active rehabilitation will take place on those areas not currently rehabilitating naturally or located within washes.

Active rehabilitation will include methods/processes designed to remove and obscure the known disturbances. Methods/processes such as breaking up compacted surfaces; recontouring to original grade; seeding and/or planting of vegetation native to, and currently occurring within, the Wilderness; and placement of dead vegetation and rock, collected near the site, to mimic the form and texture of the surrounding landscape. In the interim, all access routes will be blocked using signs and/or barricades located outside the wilderness boundary.



Looking west from Sutor Peak at a two-track vehicle route to be rehabilitated



Rock and mortar dam requiring rehabilitation



Dug well requiring rehabilitation



Typical two-track requiring rehabilitation

Table 1. North McCullough Wilderness Disturbances and Developments

Disturbance/ Development Number	Description	Length (miles)	Area of Disturbance	Location
1	Two-track vehicle route entering Wilderness from northern boundary	1.47 miles	1.75 acres	East of Sloan Canyon. Approximate route and location shown as 4-Wheel Drive road on United States Geological Survey 1:24,000 maps. T 23 and 24 S; R 61 and 62 E; Sections 36, 1, 6
2	Short two-track vehicle route intersecting Disturbance 1 near northern boundary	.07 miles	.08 acres	T 23 S; R 61 E; Section 36
3	Two-track vehicle route entering Wilderness from Hidden Valley	.30 miles	.35 acres	T 24 S; R 61 E; Section 3, SW1/4,SW1/4,SW1/4
4	Short two-track vehicle route intersecting Disturbance 3 near southern boundary	.09 miles	.10 acres	T 24 S; R 61 E; Section 10, NE1/4,NE1/4
5	Two-track vehicle route accessing North McCullough Slickrock Catchment #1 from the southern boundary and continuing to west	1.3 miles	1.51 acres	T 24 S; R 61 E; Sections 2 and 11
6	Short two-track vehicle route intersecting Disturbance 5	.12 miles	.14 acres	T24 S; R 61 E; Sections 2 and 11
7	Rock and motor dam	N/A	133 square yards	T 24 S; R 61 E; Section 1, and 6
8	Dug well	N/A	111 square yards	T 24 S; R 62 E; Section 6, SW 1/4

Disturbance/ Development Number	Description	Length (miles)	Area of Disturbance	Location
9	Short two-track vehicle route intersecting Disturbance 5 near southern boundary	.24 miles	.28 acres	T 24 S; R 61 E; Section 11
North McCullough Slickrock Catchment #1	Wildlife water development including catchment, tanks, and water access for wildlife	N/A	N/A	T 24 S; R 61 E; Section 2

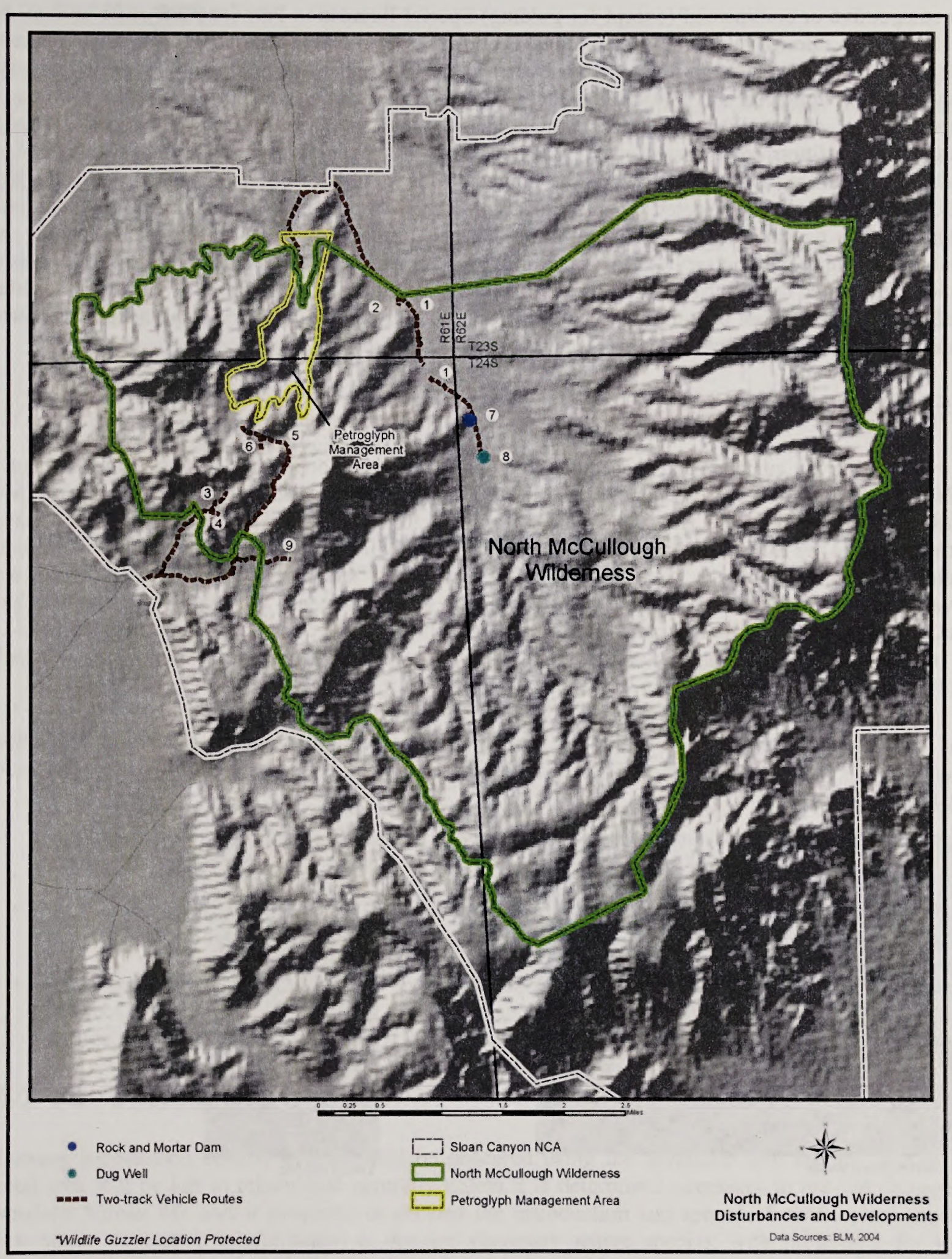
Source: BLM 2003a.

Rehabilitation of existing disturbances and developments will be conducted in order of potential for continued use. Priority will be given to the two-track vehicle routes accessing the Wilderness from Hidden Valley, Disturbances #3 (.30 miles in length), #4 (.09 miles in length), #5 (1.3 miles in length), and #6 (.12 miles in length) and #9 (.24 miles in length). These vehicle routes, despite posting have continued to be used for unauthorized access into the Wilderness and are anticipated to be a management issue until such time that signs of their presence is obscured through rehabilitation. Disturbance #1, a 1.47 mile two-track vehicle route, as well as Disturbance #2, a .07 mile long two-track spur will receive second priority. Located at the northern portion of the North McCullough Wilderness, these two disturbances have the least potential for continued unauthorized vehicle use. Although last priority for attention, in order to utilize the existing access and prevent damage to prior restoration efforts, removal and rehabilitation of the dug well (Development 8) and rock and motor dam (Development 7) will be necessary prior to the rehabilitation of Disturbances 1 and 2.

The visible portions of social trails not desired for future designation, modification, or use will be rehabilitated utilizing the same methods/processes previously identified for existing disturbances. The non-visible portions of these social trails will be left to rehabilitate naturally. Continued use of a restored social trail will be dispelled by dispersing visitation to other locations using methods such as area closures, barriers, and visitor information.

Any unauthorized activity resulting in disturbance (including vandalism); unattended personal property; and dumping within the Wilderness, will be removed or rehabilitated using a method identified through a minimum requirement/minimum tool analysis. In the case of human effects, Wilderness Rangers will receive instruction on the identification of human artifacts that are fifty years of age or more. Items that are clearly less than fifty years old will be considered unattended personal property or refuse and will be immediately removed. In the case of items clearly fifty year or more in age, or those with questionable age, they will be photographed for further consideration by an archeologist. Unattended personal property not associated with an active camp, including geocaches, will be immediately removed and held at the BLM Las Vegas Field Office. In the case of a geocache, the geocache sponsor will be notified and asked to remove the site listing from their website. Informal summit registers are considered to be casual use that does not have an effect on visitor use patterns, and as such, they may remain.

Figure 6. Disturbances and Developments within the North McCullough Wilderness



4.4 Special Recreation Permits

No competitive or commercial (except for guiding) Special Recreation Permits (SRP) will be issued for the North McCullough Wilderness. Although Section 4(c) of the Wilderness Act prohibits commercial enterprises within wilderness areas, Section 4(d)(6) of that same Act establishes a special provision allowing for commercial services to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of wilderness areas. Given this, SRPs for commercial for guiding and outfitters could issued outside the Petroglyph Management Area on a case-by-case basis for 1) the hunting of big game, which would be limited by the number of big game tags issued annually by NDOW; 2) academically oriented organizations whose primary purpose is education about wilderness or environmental education; and 3) organizations whose primary purpose is support to people with disabilities. Other guiding services (e.g. cultural, birding) will be evaluated on a case-by-case basis and could be permitted on an infrequent basis not to exceed two guided trips per month. Regularly scheduled guiding services will not be permitted and all guides will be required to educate and provide wilderness ethics information to their clients.

4.5 Wildlife Management

In order to provide guidance and procedures for coordination and cooperation between the BLM and the NDOW, regarding the management of wildlife within the North McCullough Wilderness, the MOU (BLM 2003b) between the BLM and NDOW will be followed. New water developments may be permitted if: 1) the BLM determines the water development will enhance wilderness values by promoting healthy, viable and naturally distributed wildlife populations; and 2) the visual impacts of the water development on the wilderness area can reasonably be minimized. Access to the existing North McCullough Slickrock Catchment #1 (Project #4916) will be managed in accordance with the MOU. A ¼ -mile avoidance area for non-wildlife related developments including trails will be established to protect wildlife waters from human influence.

The casual and commercial collection of reptiles will be prohibited within the North McCullough Wilderness. Permits for collection for scientific purposes may be issued on a case-by-case basis under a special use permit.



Desert bighorn sheep



Young coyote

4.6 Wildland Fire Management

4.6.1 Fire Suppression

Fire suppression within the North McCullough Wilderness will be conducted in accordance with the Las Vegas Field Office Fire Management Plan (BLM 2004b). The fire management target for suppression within the Wilderness will be to hold 90% of fires to 1 acre or less and 50 acres burned within a ten year period. The following guidelines will be employed during the suppression of all wildland fires within the Wilderness.

- A Resource Advisor will be dispatched to all fires occurring in or threatening the North McCullough Wilderness.
- Use of heavy equipment (bulldozers, etc.) will only be used in the Wilderness if the fire is threatening human life or property. The Field Manager must approve the use of heavy equipment in all cases.
- Air resources including helicopters and Single Engine Air Tankers (SEAT) will be included in the WILDCAD system for all wilderness fire suppression activities.
- Helibases, staging areas, and fire camps will be located outside of the Wilderness, unless authorized by the Field Manager.
- Use of retardant must be approved by the Field Manager.
- If retardant is not approved, water may be dropped from aircraft.
- Landing of helicopters will be kept to a minimum and will only occur in existing openings.
- All fire suppression activities will use Minimum Impact Suppression Techniques at all times.
- Hand crews may use conventional hand tools and, with approval from the Resource Advisor, may conservatively use chainsaws for fire line construction. Chainsaw use and line width should be kept to a minimum. Utilization of existing natural barriers, minimum "scratch line", and cold trailing is encouraged where feasible. Handline construction will be rehabilitated back to the natural contour.
- A "Leave No Trace" policy applies to the Wilderness. All evidence of human activity must be removed, to the maximum extent possible.
- Noxious weeds will be controlled in conformance with the "Las Vegas Field Office Noxious Weed Control, Fire Management Weed Transport Control" guidelines in the Las Vegas Field Office Fire Management Plan (BLM 2004b).

4.6.2 Fire Rehabilitation

Following suppression efforts, firelines will be obscured using the minimum tool and the rest of the burned area will be left to rehabilitate naturally unless it is determined necessary to prevent damage to downslope human life and/or property; or prevent the introduction and spread of exotic plant species. When active vegetation rehabilitation is deemed necessary native species, with preference for local genetic stock, will be used exclusively. In the event that earth moving equipment is utilized in the construction of fire line during suppression efforts, the same type of equipment may be used as needed for recontouring before the equipment is released from the fire.

4.7 Use of Signs

Inside the Petroglyph Management Area, limited amounts of small, unobtrusive signs and interpretive media may be located for the purposes of resource and wilderness protection. Because access to Sloan Canyon will be limited to the three designated trails, as described in Section 4.1, a limited number of signs, within Sloan Canyon, may become necessary to control unauthorized access at points along the canyons length. These signs will indicate that access to the Petroglyph Management Area is restricted to permitted access or guided tours only beyond this point. Two information kiosks will be placed outside the Wilderness boundary at the Visitor Center and Hidden Valley Trailhead.

Other than those identified for placement within the Petroglyph Management Area, signs and interpretive media inside the North McCullough Wilderness will not be allowed. Interpretive and administrative signs (e.g., trailhead signs, and visitor registers) will be located outside the Wilderness boundary. They will consist of low-profile, natural color signs that include pertinent information, such as route details, maps, and proper wilderness etiquette. In order to help ensure that activities (allowed within the NCA but not within Wilderness) do not encroach into the Wilderness, six foot brown fiberglass markers with decals will be used to post the boundary at all known and potential access routes, visitor use areas, and at "line of sight" distances along its entire length.

4.8 Interpretation


Sloan Canyon Petroglyph

The North McCullough Wilderness is a component of the Sloan Canyon NCA, and as such is part of the overall Sloan Canyon NCA Interpretive Strategy and Environmental Education Strategy (Appendix E). Interpretation pertaining to the North McCullough Wilderness will be concentrated primarily at the Petroglyph Management Area and its north and south access trails. Although a full range of interpretive media will be provided within the NCA with media visibility decreasing as the distance from developed areas increases, only media as identified in Section 4.7 will be allowed within the Wilderness. Guided tours will provide the greatest intensity of interpretation. When obtaining a permit, all non-guided canyon visitors will experience an interpretive presentation on appropriate visitor use and proper site etiquette while visiting the Wilderness and cultural resources sites. At the Visitor Center, this may include an interpretive video, virtual tour, or a static display; but at the Hidden Valley Trailhead or within the Sloan Canyon itself, it may be an informal presentation at the time of permitting. Other interpretive information pertaining to wilderness, natural resources and recreation will be presented on maps; brochures; and kiosks (outside the Wilderness) at the Visitor Center and Hidden Valley Trailhead. It is not anticipated that these interpretive actions will appreciably increase visitation to the Wilderness. They will however, educate visitors as to the proper use and enjoyment of wilderness and its natural resources.

4.9 Collection of Vegetation

Casual and commercial collection of vegetation is prohibited within the North McCullough Wilderness. Permits for collection for scientific purposes may be issued on a case-by-case basis under a special use permit.

4.10 Non-native Vegetation Prevention and Control

As established in the Approved RMP, the North McCullough Wilderness has been designated as a Zone 1 Management Emphasis Area (MEA) for vegetation. As a Zone 1 MEA it will receive priority in the rehabilitation or improvement of conditions in native plant communities. Ideally, the Wilderness will be managed to sustain only native vegetation species. Toward this end, activities that may lead to the spread of non-native species will not be permitted, or will be mitigated to make the spread of these species unlikely. Through annual monitoring, where non-native species are found, emphasis will be placed on controlling small infestations, plants likely to spread and displace native plants, or plants that may disrupt ecosystem function. If it is determined that control or eradication is possible, and after completion of a minimum requirement/minimum tool analysis, the following prioritized control measures may be employed: 1) grubbing with hand tools if plants will not resprout and where infestations are of a size manageable by a small number of workers; 2) herbicides applied by backpack or packhorse equipment where grubbing is not effective; 3) biological control agents approved by the Animal and Plant Health Inspection Service where infestations are of such a size that eradication is not feasible; or 4) herbicides applied with motorized equipment where control is feasible, control impacts are quickly and readily rehabilitated, and the infestation is of such size that herbicide cannot be effectively applied otherwise. In the event that natural recruitment from a local source is not adequate, reseeding control areas with native species will be permissible.

Following a minimum requirement/minimum tool analysis, BLM may conduct projects within the Wilderness, on a case-by-case basis, to rehabilitate disturbances, which would decrease the likelihood that these areas would become dominated by invasive plant species. Rehabilitation measures will include those previously identified in Section 4.3 of this plan.

Noxious and invasive weeds will be managed under integrated weed management principals, including following BLM's *Partners Against Weeds – An Action Plan for BLM* (BLM 1996) initiative for weeds, as well as the Vegetation Restoration Strategy (Appendix G).

4.11 Nighttime Use

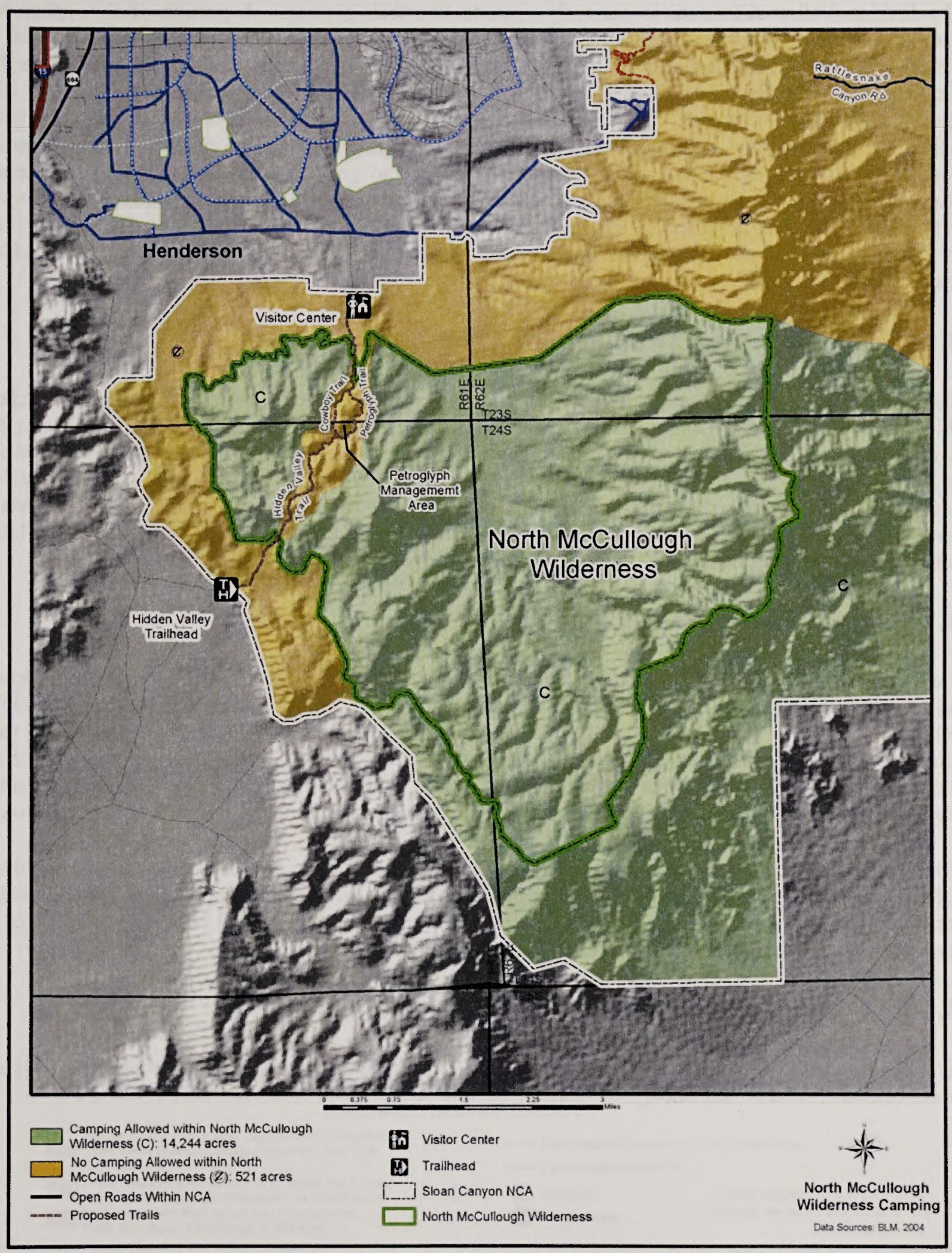
To assist in the prevention of cultural resource vandalism, destruction, and/or removal, the Petroglyph Management Area is designated for day-use only, with fires, camping, and nighttime uses prohibited (Figure 7). Exceptions to this may be allowed only under special circumstances and with approval from the Sloan Canyon NCA or BLM Las Vegas Field Office Manager.

In the remainder of the Wilderness, nighttime use including primitive, dispersed camping will be allowed. Campers will have to be self-reliant as no developed camping sites, water, or other amenities will be provided. Campfires will be allowed but, only fuels packed in can be used. Unused campfire fuels must be packed out upon exiting the Wilderness. The burning of naturally occurring fuels will not be allowed. Campfires are allowed only at a visitors camp site, using fire pans or fire blankets. All fire waste products will be packed out of the Wilderness. Construction and use of fire rings will not be allowed. BLM encourages the use of portable gas, jellied petroleum, or pressurized liquid fuel stoves for cooking. Visitor information regarding nighttime use and Leave-No-Trace principles will be provided at the Visitor Center and the Hidden Valley Trailhead.

If more than two campsites are identified within one-quarter mile of each other, the campsite(s) presenting the least (e.g., newly established) disturbance will be rehabilitated to prevent further camping

impact and proliferation of campsites. Camping sites closer than 500 feet to wildlife water developments or 300 feet to other sensitive resources (e.g., cultural sites) will be rehabilitated.

Figure 7. Camping



4.12 Livestock Grazing

The Hidden Valley Allotment is currently open to livestock grazing. A portion of this ephemeral allotment lies within the North McCullough Wilderness but, because of the rugged terrain and lack of water, cattle typically do not wander into the Wilderness. If on-the-ground evaluations determine that forage is available, BLM will allow livestock grazing in the Hidden Valley Allotment, consistent with allotment-specific objectives. Grazing in the allotment may continue unless the permittee voluntarily relinquishes the privilege, permits, or leases in which case the allotment will be closed to further livestock grazing. Cattle are the only class of livestock authorized to graze on the Hidden Valley Allotment. Horses may be kept in corrals outside the Wilderness and used to perform ranch-related work within the Wilderness. Actions designed to attract livestock into the Wilderness are prohibited. Such actions include placement of salt and mineral supplements. New range improvements will not be allowed within the NCA or Wilderness.

4.13 Equestrian and Pack Animal Use

Equestrian and pack animal use is prohibited in the Petroglyph Management Area and its northern access (Figure 8). Cross-country equestrian and pack animal use is allowed throughout the remainder of the North McCullough Wilderness. No animal, other than a horse, burro, or mule may be used for equestrian and/or pack animal use in the Wilderness. Except for incidental browsing, grazing of equestrian and/or pack animals is not authorized. Feeding of animals is limited to packed-in and certified weed-free feed to prevent the spread of noxious and invasive weeds. Watering of equestrian and/or pack animals at wildlife water developments is prohibited.

4.14 Other Recreational Use

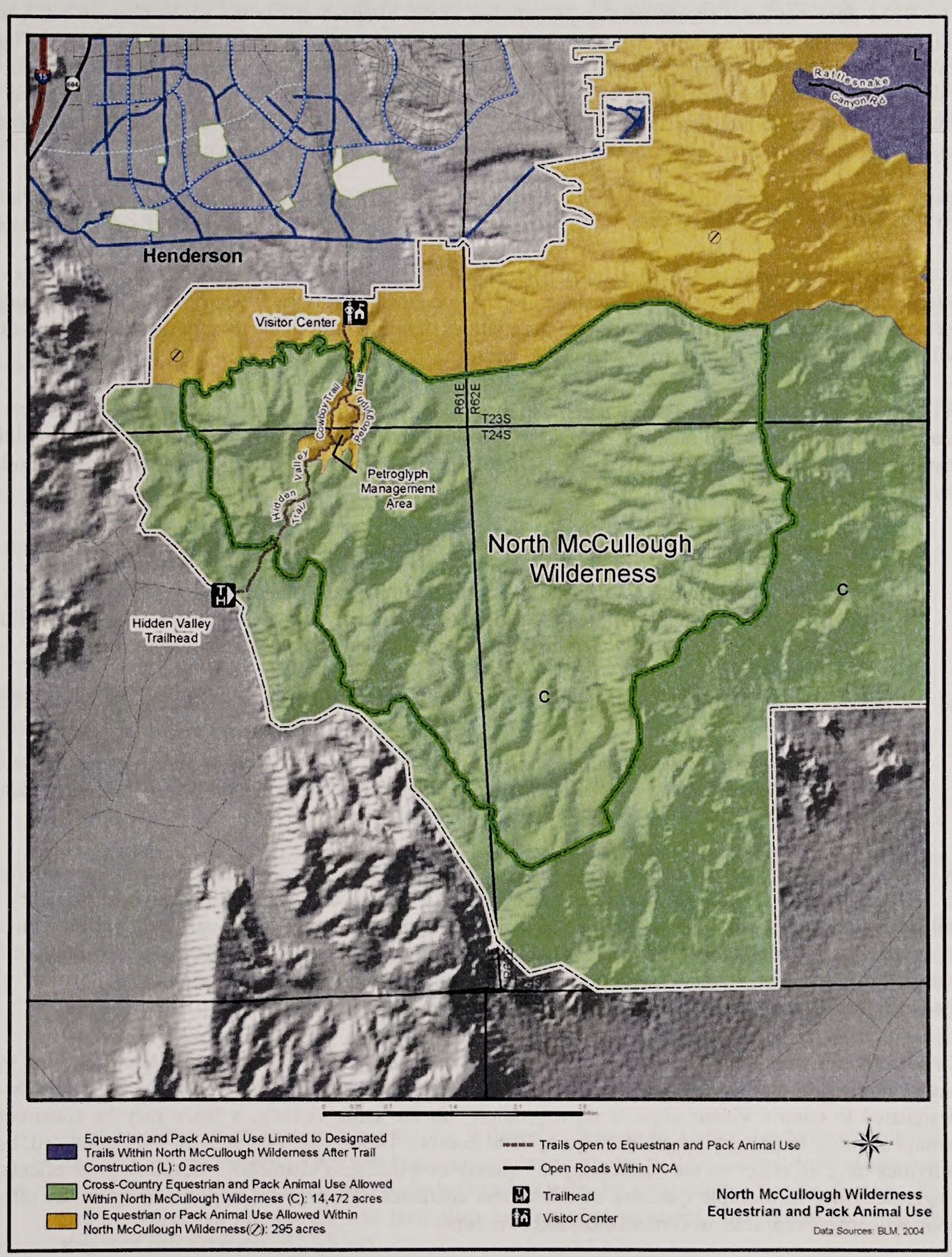
The nature of the North McCullough Wilderness is not conducive to a quality rock climbing experience. As a result, its desirability as a rock climbing destination has been low with very little rock climbing activity. This is not expected to change in the foreseeable future. Bouldering and traditional rock climbing (without permanent anchors) will be allowed in the North McCullough Wilderness except for the Petroglyph Management Area and its northern access; and areas that are found to contain sensitive resources, where it will be prohibited. Permanent anchors and other climbing hardware will be removed.

Rockhounding is prohibited throughout the Wilderness. No geocaching will be allowed anywhere within the North McCullough Wilderness. Upon discovery, geocaches will be immediately removed and held at the BLM Las Vegas Field Office. Where possible, the geocache sponsor will be notified and asked to remove the site listing from their website.

4.15 Management of Dogs

In order to eliminate the possibility of wildlife harassment and conflicts with other visitors, dogs are prohibited in the North McCullough Wilderness.

Figure 8. Equestrian and Pack Animal Use



4.16 Aircraft Overflights

The BLM does not have administrative jurisdiction of the airspace above the Sloan Canyon NCA and Wilderness. The Clark County Act specifically allows military overflights of the Wilderness. Flight testing and evaluation; designation or creation of new units of special use airspace; or establishment of training routes are not precluded. Wilderness overflights conducted by BLM will be designed to minimize impacts to wilderness characteristics. These overflights will primarily be for wilderness monitoring purposes, (e.g. checking for new disturbances, unauthorized vehicle use).

5.0 MONITORING

In the previous sections of this plan, management objectives for the North McCullough Wilderness are established and management actions designed to achieve those objectives are described. This monitoring section tracks the outcome of activities on four qualities of wilderness character, not just the quality of the wilderness the action was primarily intended to address.

Wilderness character encompasses a combination of biophysical, experiential, and symbolic elements as described by four principle qualities defined in the Wilderness Act. The combination of these qualities distinguish wilderness from all other lands. These four qualities are of equal importance to one another and are defined as:

- Untrammeled – wilderness is unhindered and free from modern human control or manipulation.
- Outstanding opportunities for solitude or a primitive and unconfined type of recreation – wilderness provides opportunities for people to experience solitude or primitive and unconfined recreation, including the values of inspiration and physical and mental challenge.
- Undeveloped – wilderness is substantially without permanent developments or modern human occupation.
- Natural - wilderness ecological systems, being affected primarily by the forces of nature, retain their primeval character and influence substantially free from the effects of modern human civilization.

A single activity is likely to have an effect on several qualities, even though the purpose of the activity is to affect only one quality of wilderness character. A single activity may improve one quality of wilderness character while diminishing another. For example an activity such as weed control, which is intended to restore natural conditions over the long term, may diminish the untrammeled condition of the wilderness in the short term. These two separate outcomes, the effectiveness on improving "natural" and the side effect of diminishing "untrammeled," will be monitored separately.

Since activities may affect several qualities, separate activities undertaken for different purposes, may cumulatively diminish one of the same qualities of wilderness character. For example, a trail might be designated to control visitor impacts on vegetation. In the same vicinity, a fence may be constructed around a spring to protect it from damage by feral horses. Though the two activities are unrelated, both activities have an effect on the "undeveloped" quality of wilderness character. Monitoring the effects of single activities to multiple qualities of wilderness character will improve understanding of the effects upon wilderness character in combination and over time.

Effects of intentional, unintentional, and unauthorized activities will all be captured under the monitoring system. This will provide a greater understanding of the overall and specific condition of the Wilderness and will alert managers of the need to initiate corrective actions. Monitoring will also provide Wilderness

Managers with more complete information which will improve the evaluating of future proposed activities. The monitoring will not be used to compare the North McCullough Wilderness with other Wilderness Areas in the National Wilderness Preservation System, but will be used to track the conditions and changes within the Wilderness itself.

The following monitoring will assist the BLM in tracking and improving the untrammeled condition of the Wilderness:

A log of annual management and other activities that control or manipulated flora, fauna, soils, water, or natural disturbance factors present in the Wilderness will be maintained in the area's permanent wilderness file. A description, location, purpose, and expected outcome of each activity will be documented. Activities that may be tracked include—

- Rehabilitation projects
- Fire suppression activities
- Treatments of non-native vegetation
- Relocation of wildlife
- Wildlife water developments (guzzlers)
- Periods of livestock grazing

The following monitoring will assist the BLM in preserving the outstanding opportunities for solitude or a primitive and unconfined type of recreation:

- A log of sights and sounds of civilization will be maintained in the permanent wilderness file. A description and location of the activity inside or outside the Wilderness will be documented.
- A log of all restrictions on visitor use within the Wilderness will be maintained in the permanent wilderness file. A description of the restriction and its purpose will be documented.
- Visitor use encounters on designated trails will be monitored through one or more of the following methods. Opportunities for visitor sign-in and comment may be available at the trailheads. Public comments received at the trailhead, by mail, or e-mail will be periodically compiled and reviewed. Automated visitor counters may be located at trailheads. In addition, a Wilderness Ranger will visit trailheads at least once a month to record the number of parked vehicles and collect written comments (if any) or record trail counter data. The Wilderness Ranger will hike each trail monthly to record the number of encounters and trail conditions.
- Trail conditions will be monitored by the Wilderness Ranger to assure standards established in this plan are maintained. Trail tread measurements and photos will be taken at several monitoring points identified for each trail and recorded electronically by a Global Positioning System. Photo and measurement monitoring will take place as needed at locations observed to be in the early stages of deterioration or high use.

- Visitor use encounters off-trail are unlikely to exceed acceptable limits and will not be as frequently monitored; however, any off-trail encounter by a Wilderness Ranger will be recorded, as well as any public comments or volunteer reports regarding off-trail encounters or conditions, and entries from registers. An important focus for monitoring off-trail use will be to identify the development of informal use trails (social trails). A review of published or internet provided information will also be used to identify areas of new popularity and then inspected in the field. Where monitoring identifies elevated use patterns, and especially if violations are detected, Law Enforcement Ranger patrols will be increased in those areas. Trail counters may also be used where elevated use patterns are detected.

- The Wilderness will be monitored at boundary roads or access points once a month by Law Enforcement Rangers to detect vehicle entry violations. Low-level overflight monitoring may be used to assist in detecting motor vehicle violations in progress, or to identify other activities undetected by ground monitoring.

The following monitoring will assist the BLM to track and, where possible, improve the undeveloped and natural appearance of the wilderness:

- A log of all the developments present in the Wilderness will be maintained in the permanent wilderness file. A description, location, purpose, and expected outcome of the feature will be documented.

- All former vehicle trails that are rehabilitated will be checked in the field at least twice a year to assure they are not continuing to receive motorized use and the success of rehabilitation. If unauthorized vehicle use continues, modifications as described in this plan will be made to the closure.

The following monitoring will assist the BLM in preserving the naturalness and primeval character and influence of the wilderness:

A log of all known human alterations to the ecosystem will be maintained in the area's permanent wilderness file. A description and location will be documented or referenced. Conditions that may be tracked include:

- Non-native species
- Threatened, endangered and sensitive species
- Species no longer present in the Wilderness
- Air quality
- Presence, abundance, and distribution of native species

A log of natural disturbances will be maintained in the area's permanent wilderness file. A description and location will be documented or referenced. Activities that may be tracked include—

- Fire
- Flood
- Insect or disease outbreaks

Monitoring for noxious weeds will occur at least once a year, especially focused on trails, in washes or other areas receiving regular visitor use.

Wildlife monitoring will primarily be conducted by NDOW according to the agency's established protocol. The BLM Wilderness Rangers will also record wildlife sightings, especially for nesting raptors, bighorn sheep, Gila monster, chuckwalla, and desert tortoise. Monitoring or research by other entities may occur according to protocol described in this plan.

Livestock monitoring will be conducted during active periods within the Hidden Valley Allotment. Monitoring will be conducted on at least a monthly basis as well as in association with other monitoring efforts within the Wilderness. The number of animals, location within the Wilderness, and animal identifiers will be documented and added to the area's permanent file.

Findings or a reference to the findings of inventory, monitoring, and research projects completed in the Wilderness will be included in the permanent wilderness file. Other known research outside the Wilderness, but applicable to the understanding of the wilderness ecosystem, may be referenced.

5.1 Plan Evaluation

All field reports, photographs, and monitoring data will be maintained in the official wilderness files at the BLM Las Vegas Field Office. The North McCullough WMP will be revised when the management actions prescribed no longer meet the wilderness management objectives, or when a change in the existing situation warrants revised management. The need for revision will be reviewed every five years. If the decision is made to revise this plan it will be accomplished with public participation. Minor revisions such as typographical or cartographical errors will be made by inserting an errata sheet.

5.2 Plan Implementation Sequence

Management of the North McCullough Wilderness will be carried out in accordance with this plan under the direction of the BLM Las Vegas Field Office Wilderness staff. Other BLM staff and volunteers may be called upon for support or subject expertise. Four types of management activities may occur: 1) ongoing activities carried out through the life of the plan; 2) activities that will be implemented as special projects as identified in the plan; 3) management activities that are triggered by changes in conditions as detected through monitoring; and, 4) activities that may be proposed in the future for which general guidance exists in the plan, or that may not be addressed in the plan. The actual implementation could be altered based on funding and staff availability outside the control of this plan. The following list shows the priority sequence for accomplishing management activities of the plan.

5.2.1 Ongoing Activities

- Maintenance of boundary signs
- Trailhead and vehicle access point maintenance
- Wilderness monitoring
  - Visitor use monitoring
  - Natural resource monitoring
  - Trail condition monitoring
  - All other wilderness character monitoring

- Visitor information dissemination

5.2.2 Special Projects (in order of priority)

- Archaeological, botanical, and T&E clearances to support plan implementation.
- Write and publish supplemental rules for all visitor use standards established in the plan as specified under 43 CFR 8365.1-6.
- Rehabilitation
  - Former vehicle routes
  - Rock and mortar dam
  - Dug well
- Trail designation
  - Trail construction
  - Trail marking
  - Trailhead development (Coordinated with Sloan Canyon NCA)
- Signing
  - Trailhead and access point wilderness information signs
  - Trailhead kiosks
  - Wilderness boundary markers
  - Sloan Canyon access limitation markers

5.2.3 Changing Conditions

- Rehabilitation
  - New visitor impacts
  - Fire rehabilitation
- Trail maintenance and stabilization
- Management of social conditions
  - Visitor use requirements
  - Group size
- Fire suppression
- Non-native plant control

5.2.4 Potential Future Proposals

- Guiding, outfitters, and other SRPs

- Wildlife projects
- Natural resources research

Future proposals not analyzed within this document will require separate Environmental Assessments and 30-day public notification.

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APPENDIX A

Enacting Legislation and Management Guidance

ENACTING LEGISLATION AND MANAGEMENT GUIDANCE

This appendix contains the enacting legislation and management guidance for the Sloan Canyon National Conservation Area. It includes —

Section 1.0 - Clark County Conservation of Public Land and Natural Resources Act of 2002, Title VI

Section 2.0 - Clark County Conservation of Public Land and Natural Resources Act of 2002, Title II

Section 3.0 - Wilderness Act of 1964

Section 4.0 – Standard Operating Procedures

1.0 CLARK COUNTY CONSERVATION OF PUBLIC LAND AND NATURAL RESOURCES ACT OF 2002 (PUBLIC LAW 107-282-NOV. 6, 2002),TITLE VI

TITLE VI—SLOAN CANYON NATIONAL CONSERVATION AREA

SEC. 601. SHORT TITLE.

This title may be cited as the ''Sloan Canyon National Conservation Area Act''.

SEC. 602. PURPOSE.

The purpose of this title is to establish the Sloan Canyon National Conservation Area to conserve, protect, and enhance for the benefit and enjoyment of present and future generations the cultural, archaeological, natural, wilderness, scientific, geological, historical, biological, wildlife, educational, and scenic resources of the Conservation Area.

SEC. 603. DEFINITIONS.

In this title:

(1) CONSERVATION AREA.—The term ''Conservation Area'' means the Sloan Canyon National Conservation Area established by section 604(a).

(2) FEDERAL PARCEL.—The term ''Federal parcel'' means the parcel of Federal land consisting of approximately 500 acres that is identified as Tract A on the map entitled ''Southern Nevada Public Land Management Act'' and dated October 1, 2002.

(3) MANAGEMENT PLAN.—The term ''management plan'' means the management plan for the Conservation Area developed under section 605(b).

(4) MAP.—The term ''map'' means the map entitled ''Southern Nevada Public Land Management Act'' and dated October 1, 2002.

SEC. 604. ESTABLISHMENT.

(a) IN GENERAL.—For the purpose described in section 602, there is established in the State a conservation area to be known as the Sloan Canyon National Conservation Area.

(b) AREA INCLUDED.—The Conservation Area shall consist of approximately 48,438 acres of public land in the County, as generally depicted on the map.

(c) MAP AND LEGAL DESCRIPTION.—

(1) IN GENERAL.—As soon as practicable after the date of enactment of this Act, the Secretary shall submit to Congress a map and legal description of the Conservation Area.

(2) EFFECT.—The map and legal description shall have the same force and effect as if included in this section, except that the Secretary may correct minor errors in the map or legal description.

(3) PUBLIC AVAILABILITY.—A copy of the map and legal description shall be on file and available for public inspection in the appropriate office of the Bureau of Land Management.

SEC. 605. MANAGEMENT.

(a) IN GENERAL.—The Secretary, acting through the Director of the Bureau of Land Management, shall manage the Conservation Area—

(1) in a manner that conserves, protects, and enhances the resources of the Conservation Area; and

(2) in accordance with—

(A) the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.); and

(B) other applicable law, including this Act.

(b) MANAGEMENT PLAN.—

(1) IN GENERAL.—Not later than 3 years after the date of enactment of this Act, the Secretary, in consultation with the State, the city of Henderson, the County, and any other interested persons, shall develop a management plan for the Conservation Area.

(2) REQUIREMENTS.—The management plan shall—

(A) describe the appropriate uses and management of the Conservation Area;

(B)(i) authorize the use of motorized vehicles in the Conservation Area—

(I) for installing, repairing, maintaining, and reconstructing water development projects, including guzzlers, that would enhance the Conservation Area by promoting healthy, viable, and more naturally distributed wildlife populations; and

(II) subject to any limitations that are not more restrictive than the limitations on such uses authorized in wilderness areas under section 208; and

(ii) include or provide recommendations on ways of minimizing the visual impacts of such activities on the Conservation Area;

(C) include a plan for litter cleanup and public lands awareness campaign on public lands in and around the Conservation Area; and

(D) include a recommendation on the location for a right-of-way for a rural roadway to provide the city of Henderson with access to the Conservation Area, in accordance with the application numbered N–65874.

(c) USES.—The Secretary shall allow only such uses of the Conservation Area that the Secretary determines will further the purpose described in section 602.

(d) MOTORIZED VEHICLES.—Except as needed for administrative purposes or to respond to an emergency, the use of motorized vehicles in the Conservation Area shall be permitted only on roads and trails designated for the use of motorized vehicles by the management plan developed under subsection (b).

(e) WITHDRAWAL.—

(1) IN GENERAL.—Subject to valid existing rights, all public land in the Conservation Area is withdrawn from—

(A) all forms of entry and appropriation under the public land laws;

(B) location, entry, and patent under the mining laws; and

(C) operation of the mineral leasing, mineral materials, and geothermal leasing laws.

(2) ADDITIONAL LAND.—Notwithstanding any other provision of law, if the Secretary acquires mineral or other interests in a parcel of land within the Conservation Area after the date of enactment of this Act, the parcel is withdrawn from operation of the laws referred to in paragraph (1) on the date of acquisition of the land.

(f) HUNTING, FISHING, AND TRAPPING.—

(1) IN GENERAL.—Nothing in this title affects the jurisdiction of the State with respect to fish and wildlife, including hunting, fishing, and trapping in the Conservation Area.

(2) LIMITATIONS.—

(A) REGULATIONS.—The Secretary may designate by regulation areas in which, and establish periods during which, for reasons of public safety,

administration, or compliance with applicable laws, no hunting, fishing, or trapping will be permitted in the Conservation Area.

(B) CONSULTATION.—Except in emergencies, the Secretary shall consult with the appropriate State agency before promulgating regulations under subparagraph (A) that close a portion of the Conservation Area to hunting, fishing, or trapping.

(g) NO BUFFER ZONES.—

(1) IN GENERAL.—The establishment of the Conservation Area shall not create an express or implied protective perimeter or buffer zone around the Conservation Area.

(2) PRIVATE LAND.—If the use of, or conduct of an activity on, private land that shares a boundary with the Conservation Area is consistent with applicable law, nothing in this title concerning the establishment of the Conservation Area shall prohibit or limit the use or conduct of the activity.

SEC. 606. SALE OF FEDERAL PARCEL.

(a) IN GENERAL.—Notwithstanding sections 202 and 203 of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1712, 1713) and subject to valid existing rights, not later than 1 year after the date of enactment of this Act, the Secretary shall convey to the highest qualified bidder all right, title, and interest of the United States in and to the Federal parcel.

(b) DISPOSITION OF PROCEEDS.—Of the gross proceeds from the conveyance of land under subsection (a)—

(1) 5 percent shall be available to the State for use in the general education program of the State; and

(2) the remainder shall be deposited in the special account established under the Southern Nevada Public Lands Management Act of 1998 (Public Law 105–263; 112 Stat. 2345), to be available to the Secretary, without further appropriation for—

(A) the construction and operation of facilities to support the management of the Conservation Area;

(B) the construction and repair of trails and roads in the Conservation Area authorized under the management plan;

(C) research on and interpretation of the archaeological and geological resources of the Conservation Area;

(D) conservation and research relating to the Conservation Area; and

(E) any other purpose that the Secretary determines to be consistent with the purpose described in section 602.

SEC. 607. RIGHT-OF-WAY.

Not later than 180 days after the date of enactment of this Act, the Secretary shall convey to the City of Henderson the public right-of-way requested for public trail purposes under the application numbered N–76312 and the public right-of-way requested for public trail purposes under the application numbered N–65874.

2.0 CLARK COUNTY CONSERVATION OF PUBLIC LAND AND NATURAL RESOURCES ACT OF 2002 (PUBLIC LAW 107-282-NOV. 6, 2002), TITLE II

TITLE II--WILDERNESS AREAS

SEC. 201. FINDINGS.

The Congress finds that--

(1) public land in the County contains unique and spectacular natural resources, including--

(A) priceless habitat for numerous species of plants and wildlife; and

(B) thousands of acres of pristine land that remain in a natural state;

(2) continued preservation of those areas would benefit the County and all of the United States by--

(A) ensuring the conservation of ecologically diverse habitat;

(B) conserving primitive recreational resources; and

(C) protecting air and water quality.

SEC. 202. ADDITIONS TO NATIONAL WILDERNESS PRESERVATION SYSTEM.

(a) ADDITIONS- The following land in the State is designated as wilderness and as components of the National Wilderness Preservation System:

(1) ARROW CANYON WILDERNESS- Certain Federal land managed by the Bureau of Land Management, comprising approximately 27,530 acres, as generally depicted on the map entitled `Arrow Canyon', dated October 1, 2002, which shall be known as the `Arrow Canyon Wilderness'.

(2) BLACK CANYON WILDERNESS- Certain Federal land within the Lake Mead National Recreation Area and an adjacent portion of Federal land managed by the Bureau of Land Management, comprising approximately 17,220 acres, as generally depicted on the map entitled `Eldorado/Spirit Mountain', dated October 1, 2002, which shall be known as the `Black Canyon Wilderness'.

(3) BRIDGE CANYON WILDERNESS- Certain Federal land within the Lake Mead National Recreation Area, comprising approximately 7,761acres, as generally depicted on the map entitled `Eldorado/Spirit Mountain', dated October 1, 2002, which shall be known as the `Bridge Canyon Wilderness'.

(4) ELDORADO WILDERNESS- Certain Federal land within the Lake Mead National Recreation Area and an adjacent portion of Federal land managed by the Bureau of Land Management, comprising approximately 31,950 acres, as generally depicted on the map entitled `Eldorado/Spirit Mountain', dated October 1, 2002, which shall be known as the `Eldorado Wilderness'.

(5) IRETEBA PEAKS WILDERNESS- Certain Federal land within the Lake Mead National Recreation Area and an adjacent portion of Federal land managed by the Bureau of Land Management, comprising approximately 32,745 acres, as generally depicted on the map entitled `Eldorado/Spirit Mountain', dated October 1, 2002, which shall be known as the `Ireteba Peaks Wilderness'.

(6) JIMBILNAN WILDERNESS- Certain Federal land within the Lake Mead National Recreation Area, comprising approximately 18,879 acres, as generally depicted on the map entitled `Muddy Mountains', dated October 1, 2002, which shall be known as the `Jimbilnan Wilderness'.

(7) JUMBO SPRINGS WILDERNESS- Certain Federal land managed by the Bureau of Land Management, comprising approximately 4,631 acres, as generally depicted on the map entitled `Gold Butte', dated October 1, 2002, which shall be known as the `Jumbo Springs Wilderness'.

(8) LA MADRE MOUNTAIN WILDERNESS- Certain Federal land within the Toiyabe National Forest and an adjacent portion of Federal land managed by the Bureau of Land Management, comprising approximately 47,180 acres, as generally depicted on the map entitled `Spring Mountains', dated October 1, 2002, which shall be known as the `La Madre Mountain Wilderness'.

(9) LIME CANYON WILDERNESS- Certain Federal land managed by the Bureau of Land Management, comprising approximately 23,233 acres, as generally depicted on the map entitled `Gold Butte', dated October 1, 2002, which shall be known as the `Lime Canyon Wilderness'.

(10) MT. CHARLESTON WILDERNESS ADDITIONS- Certain Federal land within the Toiyabe National Forest and an adjacent portion of Federal land managed by the Bureau of Land Management, comprising approximately 13,598 acres, as generally depicted on the map entitled `Spring Mountains', dated October 1, 2002, which shall be included in the Mt. Charleston Wilderness.

(11) MUDDY MOUNTAINS WILDERNESS- Certain Federal land within the Lake Mead National Recreation Area and an adjacent portion of land managed by the Bureau of Land Management, comprising approximately 48,019 acres, as generally depicted on the map entitled `Muddy Mountains', dated October 1, 2002, which shall be known as the `Muddy Mountains Wilderness'.

(12) NELLIS WASH WILDERNESS- Certain Federal land within the Lake Mead National Recreation Area, comprising approximately 16,423 acres, as generally depicted on the map entitled `Eldorado/Spirit Mountain', dated October 1, 2002, which shall be known as the `Nellis Wash Wilderness'.

(13) NORTH MCCULLOUGH WILDERNESS- Certain Federal land managed by the Bureau of Land Management, comprising approximately 14,763 acres, as generally depicted on the map entitled `McCulloughs', dated October 1, 2002, which shall be known as the `North McCullough Wilderness'.

(14) PINTO VALLEY WILDERNESS- Certain Federal land within the Lake Mead National Recreation Area, comprising approximately 39,173 acres, as generally depicted on the map entitled `Muddy Mountains', dated October 1, 2002, which shall be known as the `Pinto Valley Wilderness'.

(15) RAINBOW MOUNTAIN WILDERNESS- Certain Federal land within the Toiyabe National Forest and an adjacent portion of Federal land managed by the Bureau of Land Management, comprising approximately 24,997 acres, as generally depicted on the map entitled `Spring Mountains', dated October 1, 2002, which shall be known as the `Rainbow Mountain Wilderness'.

(16) SOUTH MCCULLOUGH WILDERNESS- Certain Federal land managed by the Bureau of Land Management, comprising approximately 44,245 acres, as generally depicted on the map entitled `McCulloughs', dated October 1, 2002, which shall be known as the `South McCullough Wilderness'.

(17) SPIRIT MOUNTAIN WILDERNESS- Certain Federal land within the Lake Mead National Recreation Area and an adjacent portion of Federal land managed by the Bureau of Land Management, comprising approximately 33,518 acres, as generally depicted on the map entitled `Eldorado/Spirit Mountain', dated October 1, 2002, which shall be known as the `Spirit Mountain Wilderness'.

18) WEE THUMP JOSHUA TREE WILDERNESS- Certain Federal land managed by the Bureau of Land Management, comprising approximately 6,050 acres, as generally depicted on the map entitled `McCulloughs', dated October 1, 2002, which shall be known as the `Wee Thump Joshua Tree Wilderness'.

(b) BOUNDARY-

(1) LAKE OFFSET- The boundary of any portion of a wilderness area designated by subsection (a) that is bordered by Lake Mead, Lake Mohave, or the Colorado River shall be 300 feet inland from the high water line.

(2) ROAD OFFSET- The boundary of any portion of a wilderness area designated by subsection (a) that is bordered by a road shall be at least 100 feet from the edge of the road to allow public access.

(c) MAP AND LEGAL DESCRIPTION-

(1) IN GENERAL- As soon as practicable after the date of enactment of this Act, the Secretary shall file a map and legal description of each wilderness area designated by subsection

(a) with the Committee on Resources of the House of Representatives and the Committee on Energy and Natural Resources of the Senate.

(2) EFFECT- Each map and legal description shall have the same force and effect as if included in this section, except that the Secretary may correct clerical and typographical errors in the map or legal description.

(3) AVAILABILITY- Each map and legal description shall be on file and available for public inspection in the appropriate offices of the Bureau of Land Management, National Park Service, or Forest Service, as applicable.

(d) WITHDRAWAL- Subject to valid existing rights, the wilderness areas designated in this section are withdrawn from--

(1) all forms of entry, appropriation, and disposal under the public land laws;

(2) location, entry, and patent under the mining laws; and

(3) operation of the mineral leasing, mineral materials, and geothermal leasing laws.

SEC. 203. ADMINISTRATION.

(a) MANAGEMENT- Subject to valid existing rights, each area designated as wilderness by this title shall be administered by the Secretary in accordance with the Wilderness Act (16 U.S.C. 1131 et seq.), except that--

(1) any reference in that Act to the effective date shall be considered to be a reference to the date of enactment of this Act; and

(2) any reference in that Act to the Secretary of Agriculture shall be considered to be a reference to the Secretary of the Interior with respect to lands administered by the Secretary of the Interior.

(b) LIVESTOCK- Within the wilderness areas designated under this title that are administered by the Bureau of Land Management, the grazing of livestock in areas in which grazing is established as of the date of enactment of this Act shall be allowed to continue, subject to such reasonable regulations, policies, and practices that the Secretary considers necessary, consistent with section 4(d)(4) of the Wilderness Act (16 U.S.C. 1133(d)(4)), including the guidelines set forth in Appendix A of House Report 101-405.

(c) INCORPORATION OF ACQUIRED LANDS AND INTERESTS- Any land or interest in land within the boundaries of an area designated as wilderness by this title that is acquired by the United States after the date of enactment of this Act shall be added to and administered as part of the wilderness area within which the acquired land or interest is located.

(d) WATER RIGHTS-

(1) FINDINGS- Congress finds that--

(A) the lands designated as Wilderness by this Act are within the Mojave Desert, are arid in nature, and include ephemeral streams;

(B) the hydrology of the lands designated as wilderness by this Act is locally characterized by complex flow patterns and alluvial fans with impermanent channels;

(C) the subsurface hydrogeology of the region is characterized by ground water subject to local and regional flow gradients and artesian aquifers;

(D) the lands designated as wilderness by this Act are generally not suitable for use or development of new water resource facilities and there are no actual or proposed water resource facilities and no opportunities for diversion, storage, or other uses of water occurring outside such lands that would adversely affect the wilderness or other values of such lands; and

(E) because of the unique nature and hydrology of these desert lands designated as wilderness by this Act and the existence of the Clark County Multi-Species Habitat Conservation Plan it is possible to provide for proper management and protection of the wilderness, perennial springs and other values of such lands in ways different from those used in other legislation.

(2) STATUTORY CONSTRUCTION-

(A) Nothing in this Act shall constitute or be construed to constitute either an express or implied reservation by the United States of any water or water rights with respect to the lands designated as Wilderness by this Act.

(B) Nothing in this Act shall affect any water rights in the State of Nevada existing on the date of the enactment of this Act, including any water rights held by the United States.

(C) Nothing in this subsection shall be construed as establishing a precedent with regard to any future wilderness designations.

(D) Nothing in this Act shall be construed as limiting, altering, modifying, or amending any of the interstate compacts or equitable apportionment decrees that apportion water among and between the State of Nevada and other States.

(E) Nothing in this subsection shall be construed as limiting, altering, modifying, or amending the Clark County Multi-Species Habitat Conservation Plan (MSHCP) with respect to the lands designated as Wilderness by this Act including the MSHCP's specific management actions for the conservation of perennial springs.

(3) NEVADA WATER LAW- The Secretary shall follow the procedural and substantive requirements of the law of the State of Nevada in order to obtain and hold any water rights not in existence on the date of enactment of this Act with respect to the wilderness areas designated by this Act.

(4) NEW PROJECTS-

(A) As used in this paragraph, the term `water resource' facility means irrigation and pumping facilities, reservoirs, water conservation works, aqueducts, canals, ditches, pipelines, wells, hydropower projects, and transmission and other ancillary facilities, and other water diversion, storage, and carriage structures. The term `water resource' facility does not include wildlife guzzlers.

(B) Except as otherwise provided in this Act, on and after the date of the enactment of this Act, neither the President nor any other officer, employee, or agent of the United States shall fund, assist, authorize, or issue a license or permit for the development of any new water resource facility within the wilderness areas designated by this Act.

SEC. 204. ADJACENT MANAGEMENT.

(a) IN GENERAL- Congress does not intend for the designation of wilderness in the State pursuant to this title to lead to the creation of protective perimeters or buffer zones around any such wilderness area.

(b) NONWILDERNESS ACTIVITIES- The fact that nonwilderness activities or uses can be seen or heard from areas within a wilderness designated under this title shall not preclude the conduct of those activities or uses outside the boundary of the wilderness area.

SEC. 205. MILITARY OVERFLIGHTS.

Nothing in this title restricts or precludes--

(1) low-level overflights of military aircraft over the areas designated as wilderness by this title, including military overflights that can be seen or heard within the wilderness areas;

(2) flight testing and evaluation; or

(3) the designation or creation of new units of special use airspace, or the establishment of military flight training routes, over the wilderness areas.

SEC. 206. NATIVE AMERICAN CULTURAL AND RELIGIOUS USES.

Nothing in this Act shall be construed to diminish the rights of any Indian Tribe. Nothing in this Act shall be construed to diminish tribal rights regarding access to Federal lands for tribal activities, including spiritual, cultural, and traditional food-gathering activities.

SEC. 207. RELEASE OF WILDERNESS STUDY AREAS.

(a) FINDING- Congress finds that, for the purposes of section 603 of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1782), the public land in the County administered by the Bureau of Land Management and the Forest Service in the following areas have been adequately studied for wilderness designation:

(1) The Garrett Buttes Wilderness Study Area.
(2) The Quail Springs Wilderness Study Area.
(3) The Nellis A, B, C Wilderness Study Area.
(4) Any portion of the wilderness study areas--
(A) not designated as wilderness by section 202(a); and
(B) designated for release on--
(i) the map entitled `Muddy Mountains' and dated October 1, 2002;
(ii) the map entitled `Spring Mountains' and dated October 1, 2002;
(iii) the map entitled `Arrow Canyon' and dated October 1, 2002;
(iv) the map entitled `Gold Butte' and dated October 1, 2002;
(v) the map entitled `McCullough Mountains' and dated October 1, 2002;
(vi) the map entitled `El Dorado/Spirit Mountain' and dated October 1, 2002; or
(vii) the map entitled `Southern Nevada Public Land Management Act' and dated October 1, 2002.

(b) RELEASE- Except as provided in subsection (c), any public land described in subsection (a) that is not designated as wilderness by this title--
(1) is no longer subject to section 603(c) of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1782(c)); and
(2) shall be managed in accordance with--
(A) land management plans adopted under section 202 of that Act (43 U.S.C. 1712);
(B) existing cooperative conservation agreements.

(c) RIGHT-OF-WAY GRANT- The Secretary shall issue to the State-regulated sponsor of the Centennial Project the right-of-way for the construction and maintenance of two 500-kilovolt electrical transmission lines. The construction shall occur within a 500-foot-wide corridor that is released from the Sunrise Mountains Instant Study Area in the County as depicted on the Southern Nevada Public Land Management Act map, dated October 1, 2002.

SEC. 208. WILDLIFE MANAGEMENT.

(a) IN GENERAL- In accordance with section 4(d)(7) of the Wilderness Act (16 U.S.C. 1133(d)(7)), nothing in this title affects or diminishes the jurisdiction of the State with respect to fish and wildlife management, including the regulation of hunting, fishing, and trapping, in the wilderness areas designated by this title.

(b) MANAGEMENT ACTIVITIES- In furtherance of the purposes and principles of the Wilderness Act, management activities to maintain or restore fish and wildlife populations and the habitats to support such populations may be carried out within wilderness areas designated by this title where consistent with relevant wilderness management plans, in accordance with appropriate policies such as those set forth in Appendix B of House Report 101-405, including the occasional and temporary use of motorized vehicles, if such use, as determined by the Secretary, would promote healthy, viable, and more naturally distributed wildlife populations that would enhance wilderness values and accomplish those purposes with the minimum impact necessary to reasonably accomplish the task.

(c) EXISTING ACTIVITIES- Consistent with section 4(d)(1) of the Wilderness Act (16 U.S.C. 1133(d)) and in accordance with appropriate policies such as those set forth in Appendix B of House Report 101-405, the State may continue to use aircraft, including helicopters, to survey, capture, transplant, monitor, and provide water for wildlife populations, including bighorn sheep, and feral stock, horses, and burros.

3.0 NATIONAL WILDERNESS PRESERVATION SYSTEM (WILDERNESS ACT OF 1964)

Public Law 88-577
88th Congress, S. 4
September 3, 1964

An Act

To establish a National Wilderness Preservation System for the permanent good of the whole people, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Short Title

Section 1. This Act may be cited as the "Wilderness Act".

Wilderness System Established Statement of Policy

Sec. 2. (a) In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness. For this purpose there is hereby established a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as "wilderness areas", and these shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness; and no Federal lands shall be designated as "wilderness areas" except as provided for in this Act or by a subsequent Act.

(b) The inclusion of an area in the National Wilderness Preservation System notwithstanding, the area shall continue to be managed by the Department and agency having jurisdiction thereover immediately before its inclusion in the National Wilderness Preservation System unless otherwise provided by Act of Congress. No appropriation shall be available for the payment of expenses or salaries for the administration of the National Wilderness Preservation System as a separate unit nor shall any appropriations be available for additional personnel stated as being required solely for the purpose of managing or administering areas solely because they are included within the National Wilderness Preservation System.

Definition of Wilderness

(c) A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a

primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

National Wilderness Preservation System -- Extent of System

Sec. 3. (a) All areas within the national forests classified at least 30 days before the effective date of this Act by the Secretary of Agriculture or the Chief of the Forest Service as "wilderness", "wild", or "canoe" are hereby designated as wilderness areas. The Secretary of Agriculture shall --

(1) Within one year after the effective date of this Act, file a map and legal description of each wilderness area with the Interior and Insular Affairs Committees of the United States Senate and the House of Representatives, and such descriptions shall have the same force and effect as if included in this Act: Provided, however, That correction of clerical and typographical errors in such legal descriptions and maps may be made.

(2) Maintain, available to the public, records pertaining to said wilderness areas, including maps and legal descriptions, copies of regulations governing them, copies of public notices of, and reports submitted to Congress regarding pending additions, eliminations, or modifications. Maps, legal descriptions, and regulations pertaining to wilderness areas within their respective jurisdictions also shall be available to the public in the offices of regional foresters, national forest supervisors, and forest rangers.

(b) The Secretary of Agriculture shall, within ten years after the enactment of this Act, review, as to its suitability or nonsuitability for preservation as wilderness, each area in the national forests classified on the effective date of this Act by the Secretary of Agriculture or the Chief of the Forest Service as "primitive" and report his findings to the President. The President shall advise the United States Senate and House of Representatives of his recommendations with respect to the designation as "wilderness" or other reclassification of each area on which review has been completed, together with maps and a definition of boundaries. Such advice shall be given with respect to not less than one-third of all the areas now classified as "primitive" within three years after the enactment of this Act, not less than two-thirds within seven years after the enactment of this Act, and the remaining areas within ten years after the enactment of this Act. Each recommendation of the President for designation as "wilderness" shall become effective only if so provided by an Act of Congress. Areas classified as "primitive" on the effective date of this Act shall continue to be administered under the rules and regulations affecting such areas on the effective date of this Act until Congress has determined otherwise. Any such area may be increased in size by the President at the time he submits his recommendation to the Congress by not more than five thousand acres with no more than one thousand two hundred and eighty acres of such increase in any one compact unit; if it is proposed to increase the size of any such area by more than five thousand acres or by more than one thousand two hundred and eighty acres in any one compact unit the increase in size shall not become effective until acted upon by Congress. Nothing herein contained shall limit the President in proposing, as part of his recommendations to Congress, the alteration of existing boundaries of primitive areas or recommending the addition of any contiguous area of national forest lands predominantly of wilderness value. Not withstanding any other provisions of this Act, the Secretary of Agriculture may complete his review and delete such area as may be necessary, but not to exceed seven thousand acres, from the southern tip of the Gore Range-Eagles Nest Primitive Area, Colorado, if the Secretary determines that such action is in the public interest.

(c) Within ten years after the effective date of this Act the Secretary of the Interior shall review every roadless area of five thousand contiguous acres or more in the national parks, monuments and other units of the national park system and every such area of, and every roadless island within, the national wildlife

refuges and game ranges, under his jurisdiction on the effective date of this Act and shall report to the President his recommendation as to the suitability or nonsuitability of each such area or island for preservation as wilderness. The President shall advise the President of the Senate and the Speaker of the House of Representatives of his recommendation with respect to the designation as wilderness of each such area or island on which review has been completed, together with a map thereof and a definition of its boundaries. Such advice shall be given with respect to not less than one-third of the areas and islands to be reviewed under this subsection within three years after enactment of this Act, not less than two-thirds within seven years of enactment of this Act, and the remainder within ten years of enactment of this Act. A recommendation of the President for designation as wilderness shall become effective only if so provided by an Act of Congress. Nothing contained herein shall, by implication or otherwise, be construed to lessen the present statutory authority of the Secretary of the Interior with respect to the maintenance of roadless areas within units of the national park system.

(d) (1) The Secretary of Agriculture and the Secretary of the Interior shall, prior to submitting any recommendations to the President with respect to the suitability of any area for preservation as wilderness--

(A) give such public notice of the proposed action as they deem appropriate, including publication in the Federal Register and in a newspaper having general circulation in the area or areas in the vicinity of the affected land;

(B) hold a public hearing or hearings at a location or locations convenient to the area affected. The hearings shall be announced through such means as the respective Secretaries involved deem appropriate, including notices in the Federal Register and in newspapers of general circulation in the area: Provided, That if the lands involved are located in more than one State, at least one hearing shall be held in each State in which a portion of the land lies;

(C) at least thirty days before the date of a hearing advise the Governor of each State and the governing board of each county, or in Alaska the borough, in which the lands are located, and Federal departments and agencies concerned, and invite such officials and Federal agencies to submit their views on the proposed action at the hearing or by not later than thirty days following the date of the hearing.

(d)(2) Any views submitted to the appropriate Secretary under the provisions of (1) of this subsection with respect to any area shall be included with any recommendations to the President and to Congress with respect to such area.

(e) Any modification or adjustment of boundaries of any wilderness area shall be recommended by the appropriate Secretary after public notice of such proposal and public hearing or hearings as provided on subsection (d) of this section. The proposed modification or adjustment shall then be recommended with map and description thereof to the President. The President shall advise the United States Senate and the House of Representatives of his recommendations with respect to such modification or adjustment and such recommendations shall become effective only on the same manner as provided for in subsections (b) and (c) of this section.

Use of Wilderness Areas

Sec. 4. (a) The purposes of this Act are hereby declared to be within and supplemental to the purposes for which national forests and units of the national park and national wildlife refuge systems are established and administered and --

(1) Nothing in this Act shall be deemed to be in interference with the purpose for which national forests are established as set forth in the Act of June 4, 1897 (30 Stat. 11), and the Multiple Use Sustained-Yield Act of June 12, 1960 (74 Stat. 215).

(2) Nothing in this Act shall modify the restrictions and provisions of the Shipstead-Nolan Act (Public Law 539, Seventy-first Congress, July 10, 1930; 46 Stat. 1020),the Thye-Blatnik Act (Public Law 733, Eightieth Congress, June 22, 1948; 62 Stat. 568), and the Humphrey-Thye-Blatnik-Andresen Act (Public Law 607, Eighty-fourth Congress, June 22.1965; 70 Stat. 326), as applying to the Superior National Forest or the regulations of the Secretary of Agriculture.

(3) Nothing in this Act shall modify the statutory authority under which units of the national park system are created. Further, the designation of any area of any park, monument, or other unit of the national park system as a wilderness area pursuant to this Act shall in no manner lower the standards evolved for the use and preservation of such park, monument, or other unit of the national park system in accordance with the Act of August 25, 1916, the statutory authority under which the area was created, or any other Act of Congress which might pertain to or affect such area, including, but not limited to, the Act of June 8, 1906 (34 Stat. 225; 16 U.S.C. 432 et seq.); section 3(2) of the Federal Power Act (16 U.S.C. 796 (2)); and the Act of August 21,1935 (49 Stat. 666; 16 U.S.C. 461 et seq.).

(b) Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use.

Prohibition of Certain Uses

(c) Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and, except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.

Special Provisions

(d) The following special provisions are hereby made:

(1) Within wilderness areas designated by this Act the use of aircraft or motorboats, where these uses have already become established, may be permitted to continue subject to such restrictions as the Secretary of Agriculture deems desirable. In addition, such measures may be taken as may be necessary in the control of fire, insects, and diseases, subject to such conditions as the Secretary deems desirable.

(2) Nothing in this Act shall prevent within national forest wilderness areas any activity, including prospecting, for the purpose of gathering information about mineral or other resources, if such activity is carried on in a manner compatible with the preservation of the wilderness environment. Furthermore, in accordance with such program as the Secretary of the Interior shall develop and conduct in consultation with the Secretary of Agriculture, such areas shall be surveyed on a planned, recurring basis consistent with the concept of wilderness preservation by the Geological Survey and the Bureau of Mines to

determine the mineral values , if any, that may be present; and the results of such surveys shall be made available to the public and submitted to the President and Congress.

(3) Not withstanding any other provisions of this Act, until midnight December 31, 1983, the United States mining laws and all laws pertaining to mineral leasing shall, to the extent as applicable prior to the effective date of this Act, extend to those national forest lands designated by this Act as "wilderness areas"; subject, however, to such reasonable regulations governing ingress and egress as may be prescribed by the Secretary of Agriculture consistent with the use of the land for mineral location and development and exploration, drilling, and production, and use of land for transmission lines, waterlines, telephone lines, or facilities necessary in exploring, drilling, producing, mining, and processing operations, including where essential the use of mechanized ground or air equipment and restoration as near as practicable of the surface of the land disturbed in performing prospecting, location, and , in oil and gas leasing, discovery work, exploration, drilling, and production, as soon as they have served their purpose. Mining locations lying within the boundaries of said wilderness areas shall be held and used solely for mining or processing operations and uses reasonably incident thereto; and hereafter, subject to valid existing rights, all patents issued under the mining laws of the United States affecting national forest lands designated by this Act as wilderness areas shall convey title to the mineral deposits within the claim, together with the right to cut and use so much of the mature timber therefrom as may be needed in the extraction, removal, and beneficiation of the mineral deposits, if needed timber is not otherwise reasonably available, and if the timber is cut under sound principles of forest management as defined by the national forest rules and regulations, but each such patent shall reserve to the United States all title in or to the surface of the lands and products thereof, and no use of the surface of the claim or the resources therefrom not reasonably required for carrying on mining or prospecting shall be allowed except as otherwise expressly provided in this Act: Provided, That, unless hereafter specifically authorized, no patent within wilderness areas designated by this Act shall issue after December 31, 1983, except for the valid claims existing on or before December 31, 1983. Mining claims located after the effective date of this Act within the boundaries of wilderness areas designated by this Act shall create no rights in excess of those rights which may be patented under the provisions of this subsection. Mineral leases, permits, and licenses covering lands within national forest wilderness areas designated by this Act shall contain such reasonable stipulations as may be prescribed by the Secretary of Agriculture for the protection of the wilderness character of the land consistent with the use of the land for the purposes for which they are leased, permitted, or licensed. Subject to valid rights then existing, effective January 1,1984, the minerals in lands designated by this Act as wilderness areas are withdrawn from all forms of appropriation under the mining laws and from disposition under all laws pertaining to mineral leasing and all amendments thereto.

(4) Within wilderness areas in the national forests designated by this Act, (1) the President may, within a specific area and in accordance with such regulations as he may deem desirable, authorize prospecting for water resources, the establishment and maintenance of reservoirs, water-conservation works, power projects, transmission lines, and other facilities needed in the public interest, including the road construction and maintenance essential to development and use thereof, upon his determination that such use or uses in the specific area will better serve the interests of the United States and the people thereof than will its denial; and (2) the grazing of livestock, where established prior to the effective date of this Act, shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture.

(5) Other provisions of this Act to the contrary notwithstanding, the management of the Boundary Waters Canoe Area, formerly designated as the Superior, Little Indian Sioux, and Caribou Roadless Areas, in the Superior National Forest, Minnesota, shall be in accordance with the general purpose of maintaining, without unnecessary restrictions on other uses, including that of timber, the primitive character of the

area, particularly in the vicinity of lakes, streams, and portages: Provided, That nothing in this Act shall preclude the continuance within the area of any already established use of motorboats.

(6) Commercial services may be performed within the wilderness areas designated by this Act to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas.

(7) Nothing in this Act shall constitute an express or implied claim or denial on the part of the Federal Government as to exemption from State water laws.

(8) Nothing in this Act shall be construed as affecting the jurisdiction or responsibilities of the several States with respect to wildlife and fish in the national forests.

State and Private Lands Within Wilderness Areas

Sec. 5. (a) In any case where State-owned of privately owned land is completely surrounded by national forest lands within areas designated by this Act as wilderness, such State or private owner shall be given such rights as may be necessary to assure adequate access to such State-owned or privately owned land by such State or private owner and their successors in interest, or the State-owned land or privately owned land shall be exchanged for federally owned land in the same State of approximately equal value under authorities available to the Secretary of Agriculture: Provided, however, That the United States shall not transfer to a state or private owner any mineral interests unless the State or private owner relinquishes or causes to be relinquished to the United States the mineral interest in the surrounded land.

(b) In any case where valid mining claims or other valid occupancies are wholly within a designated national forest wilderness area, the Secretary of Agriculture shall, by reasonable regulations consistent with the preservation of the area as wilderness, permit ingress and egress to such surrounded areas by means which have been or are being customarily enjoyed with respect to other such areas similarly situated.

(c) Subject to the appropriation of funds by Congress, the Secretary of Agriculture is authorized to acquire privately owned land within the perimeter of any area designated by this Act as wilderness if (1) the owner concurs in such acquisition or (2) the acquisition is specifically authorized by Congress.

Gifts, Bequests, and Contributions

Sec. 6. (a) The Secretary of Agriculture may accept gifts or bequests of land within wilderness areas designated by this Act for preservation as wilderness. The Secretary of Agriculture may also accept gifts or bequests of land adjacent to wilderness areas designated by this Act for preservation as wilderness if he has given sixty days advance notice thereof to the President of the Senate and the Speaker of the House of Representatives. Land accepted by the Secretary of Agriculture under this section shall become part of the wilderness area involved. Regulations with regard to any such land may be in accordance with such agreements, consistent with the policy of this Act, as are made at the time of such gift, or such conditions, consistent with such policy, as may be included in, and accepted with, such bequest.

(b) The Secretary of Agriculture or the Secretary of the Interior is authorized to accept private contributions and gifts to be used to further the purpose of this Act.

Annual Reports

Sec. 7. At the opening of each session of Congress, the Secretaries of Agriculture and Interior shall jointly report to the President for transmission to Congress on the status of the wilderness system, including a list

and descriptions of the areas in the system, regulations in effect, and other pertinent information, together with any recommendations they may care to make.

Approved September 3, 1964.

Legislative History

House Reports: No. 1538 accompanying H.R. 9070 (Comm. on Interior & Insular affairs) and No. 1829 (Comm. of Conference).

Senate Report No. 109 (Comm. on Interior & Insular Affairs).

Congressional Record:

Vol. 109 (1963): Apr. 4, 8, considered in Senate. Apr. 9, considered and passed Senate.

Vol. 110 (1964): July 28, considered in House. July 30, considered and passed House, amended, in lieu of H. R. 9070. Aug. 20, House and Senate agreed to conference report.

4.0 STANDARD OPERATION PROCEDURES

This section contains a list of standard operating procedures that provide guidance for activities related to the management of the Sloan Canyon National Conservation Area (NCA). This list is not comprehensive but rather represents the types of procedures with which the Bureau of Land Management (BLM) would comply.

Wilderness

Wildlife in the North McCullough Wilderness would be managed in accordance with the Memorandum of Agreement (MOU) between BLM and the Nevada Department of Wildlife ([BLM 2003c] MOU 6300-NV930-0402) entitled, "Wildlife Management in Nevada BLM Wilderness Areas," or other relevant laws, regulations, policies, or agreements.

BLM would follow a Minimum Requirement Decision Guide to determine whether management actions have the potential to negatively affect the resources and aesthetic values of the Wilderness.

Cultural Resources

In areas that might be affected by Resource Management Plan actions, cultural resources would be identified and their eligibility for the National Register of Historic Places would be determined through the Nevada State Historic Preservation Office protocol. BLM will develop and carry out an appropriate treatment plan for resources determined eligible and that might be affected.

Lands and Realty

The Black Mountain communication sites would be managed in accordance with the *Black Mountain Communication Site Plan* (BLM 1999) or current management direction.

Vegetation Management

- Vegetation in the Sloan Canyon NCA would be managed to meet the requirements of the *Clark County Multispecies Habitat Conservation Plan* (CCDCP 2000 in *Sloan Canyon Proposed RMP/FEIS* Reference List).
- BLM would follow Nevada BLM's "Partners Against Weeds—An Action Plan for the BLM" (BLM 1996 in *Sloan Canyon Proposed RMP/FEIS* Reference List) and general restoration plan for Las Vegas Field Office. Noxious and invasive weeds would be managed under integrated weed management principals.
- BLM would manage the NCA in accordance with the Mojave-Southern Great Basin Resource Advisory Council Standards and Guidelines for Rangeland Health.

Wildlife Management

- Discretionary activities proposed in bighorn sheep habitat would be evaluated on a case-by-case basis. Authorization would be considered if the proposed actions are consistent with the goals and objectives of the *Rangewide Plan for Managing Bighorn Sheep Habitat on Public Lands* (BLM 1998c in *Sloan Canyon Proposed RMP/FEIS* Reference List) and other applicable agreements, plans, laws, and regulations.

- Wildlife management would be coordinated with appropriate federal, State, and local agencies, as well as special interest groups (e.g., Partners in Flight).

Wildland Fire Management

Wildland fire management would be implemented for the Sloan Canyon Fire Management Unit based on objectives included in the *BLM Las Vegas Field Office Fire Management Activity Plan* (BLM 1998b in *Sloan Canyon Proposed RMP/FEIS* Reference List) and Fire Management Plan (BLM 2004b in *Sloan Canyon Proposed RMP/FEIS* Reference List).

Water Resources and Quality

Contributions would be minimized from both point and nonpoint sources of pollution resulting from public land management actions, in accordance with the best management practices identified by the State of Nevada.

Air Quality

- Conformity determinations would be included where applicable in activity plans and associated environmental documentation.
- Air quality dust control permits would be obtained from the Clark County Department of Air Quality and Environmental Management prior to the approval of any activity within the NCA.

Abandoned Mines

- BLM would coordinate with the Nevada Division of Mines to ensure that the entire NCA and appropriate surrounding area have been surveyed for abandoned mines.
- If additional abandoned mines are found within the NCA, BLM would either remediate per the *Final Programmatic Environmental Assessment for Remediation of Abandoned Mine Safety Hazards*, or, if necessary, prepare site-specific environmental assessment.

APPENDIX B

Recreation Monitoring Plan

APPENDIX D

VEGETATION MONITORING PLAN

RECREATION MONITORING PLAN

The Recreation Monitoring Plan contains the monitoring approach that will be used at the Sloan Canyon National Conservation Area (NCA) to ensure that management actions meet the recreation management goals and objectives described in the Approved Resource Management Plan. This Recreation Monitoring Plan is organized by resource area, followed by resource goals, objectives, and actions, and finally a description of the monitoring methods.

1.0 RESOURCE MONITORING

Monitoring is the process of collecting information to evaluate the effects of selected management actions, public actions and interests, and impacts in relation to the RMP goals and objectives and to ensure compliance with applicable laws, regulations, and policy. Data describing changing trends over time are collected and used to determine whether desired outcomes are being met.

Because the NCA and the North McCullough Wilderness were relatively recently designated, the Bureau of Land Management (BLM) Las Vegas Field Office has just begun to focus management attention on the area. Consequently only limited specific resource and visitor use baseline data exist. In addition, visitor use is expected to change drastically as urban growth surrounds the NCA, trails and facilities are developed, and the NCA transitions and management decisions contained in the RMP are implemented.

This Recreation Monitoring Plan is designed to be outcome-based, technically feasible, affordable, and operationally attainable. Three types of monitoring will occur to determine the current status of the NCA baseline and to measure changes to it:

- **Baseline Monitoring**—What are the current baseline conditions?
- **Implementation Monitoring**—Were the decisions and actions developed during planning implemented?
- **Effectiveness Monitoring**—Did the implemented action result in changes to resource condition, visitor numbers, activity types, and duration of stay? Did changes in the indicators exceed thresholds established for achieving the objectives?

To monitor change within the NCA, BLM staff would identify and track indicators, which are specific elements of the NCA setting that change in response to human activities. Indicators provide quantitative documentation on how much conditions have changed, serve as tools for examining trends and highlighting problems, and can act as an early warning to predict future conditions. When compared with standards that describe the acceptable limits of change, indicators can signal the need for corrective action, evaluate the effectiveness of management actions, and help determine whether desired conditions are being achieved. To accommodate the need for management flexibility as this development occurs, a baseline would be established and used to determine appropriate indicators and limits of acceptable change. The indicators would be monitored frequently as the NCA facilities are developed. As visitation and recreation opportunities stabilize, the monitoring frequency would become more static.

2.0 RECREATION MONITORING

Two different aspects would be considered during recreation monitoring: the social setting and the physical setting. The number of people and the number and type of encounters that take place in defined settings characterize the social setting. The physical setting includes the physical landscape and environment, ranging from primitive areas where the landscape is remote, pristine, and shows minimal evidence of human presence, to more developed areas that are manipulated to provide a desired setting and include an abundance of facilities to accommodate heavy recreational use. The first objective and its associated goals and actions refer to the social setting. The second objective refers to the physical setting.

Goal: Provide recreation opportunities within the NCA, including the North McCullough Wilderness, consistent with the Sloan Canyon NCA Act (Title VI of the Clark County Conservation of Public Land and Natural Resources Act of 2002) and Clark County Act, Title II ("Wilderness Areas").

Objective 1

Provide an array of outdoor recreation opportunities and experiences within the NCA.

Management Actions Examples

Interpretive opportunities designed to enhance recreation experiences through information on the NCA's unique cultural and natural resources would be provided to visitors.

A trail system would be developed to accommodate multiple trail uses in appropriate areas of the NCA and would be appropriately managed near wildlife water developments. Trail designs that avoid sensitive natural and cultural resource areas and Special Status Plant communities would be emphasized. Site-specific resource conditions would be considered when selecting and designing trails and adding new trails, including avoiding areas of sensitive wildlife habitat. Trails outside the North McCullough Wilderness would be evaluated to determine if they should be developed as an Americans with Disabilities Act of 1990 trails. Additional trails could be added to the trail system when a new trail would not cause substantial impacts to sensitive cultural or natural resources and would improve visitor experiences. Unauthorized constructed and social trails would be evaluated to determine whether to close and restore, or adopt them into the trail system. Permits for overnight parking to support recreation activities would be available on a case-by-case basis.

Monitoring

The formal method of monitoring the social setting would be through visitor satisfaction surveys. These comprehensive surveys would include information concerning visitor demographics, preferred activities, recreation experiences and benefits, and setting preferences, as well as evaluation of BLM management, facilities, and services. Visitor surveys would be conducted for at least 1.5 years following the completion of the RMP to establish baseline data for the seasonal variation in visitation, and regularly thereafter as the plan is implemented and visitation increases.

Monitoring would also be performed on an informal basis by BLM field personnel, volunteers, and through public participation. BLM field staff and volunteers will have training to gather data through visitor contacts and observation of social conditions. Comments from the public in the form of letters, telephone calls, e-mails, public meetings, feedback from special interest groups, or office visits will be collected and reviewed. When informal monitoring begins to indicate that the desired condition of the social setting is not being met, the next formal visitor survey should be implemented as soon as possible.

Objective 2

Manage recreation uses so that recreation-related disturbances are minimized.

Management Action Examples

Special recreation permits (SRP) could be issued consistent with the purposes of the NCA and North McCullough Wilderness to control visitor use, protect recreational and natural resources, provide for the health and safety of visitors, and provide a fair return to the Government for the opportunity to make a profit for the commercial recreational use of public lands. Competitive or vending SRPs could be issued within the NCA but not in the North McCullough Wilderness. Outfitters and guides wanting to guide hunts and conduct interpretive programs within the NCA would be required to obtain a commercial SRP from the NCA Manager to minimize potential conflicts among recreation uses. Outside the Petroglyph Management Area, organized groups would be required to obtain an SRP. Ongoing evaluations of the number, appropriateness, and impacts of commercial and competitive SRPs would be conducted, and limits could be placed on the issuance of commercial and competitive SRPs based on the evaluation and consistency with the purposes of the NCA. The NCA would be managed, in part, through Management Emphasis Areas zones.

Hiking and equestrian use would be allowed in designated areas. In trail areas, cross-country use could occur until BLM establishes and constructs trails. In open areas, cross-country travel is allowed. Mountain biking would be allowed only on a system of proposed trails and vehicle roads; cross-country biking is prohibited. Off-highway vehicles use would be prohibited throughout the NCA.

Primitive and dispersed camping would not be allowed in the Petroglyph Management Area or its north access, but it would be allowed in designated areas in other portions of the NCA. Campfires would be allowed at camping sites in fire pans or using fire blankets. No natural fuels in the NCA can be used for campfires, and all fuels must be packed in and out of the NCA. Further, all fire waste products must be packed out.

No forms of rock climbing would be allowed within the Petroglyph Management Area and its northern access, but bouldering and traditional rock climbing could be allowed outside designated sensitive resource areas in the remainder of the NCA. All forms of recreational target shooting, except permitted hunting, would be prohibited. Dogs, on leash, are allowed in the designated areas and are prohibited in the remainder of the NCA. Dog feces must immediately be picked up and packed out. Rockhounding and geocaching would be prohibited throughout the NCA.

Monitoring

Indicators used for monitoring recreation would include visitor use, evidence of human and dog waste, vandalism, areas of impact, and SRP stipulations. Methods used for monitoring would include visitor surveys for numbers of encounters, trail counters, trailhead registers, ongoing management observations, recreation site and facility measurements, and permit evaluation and compliance. The frequency of monitoring would vary as development and visitation increase.

A team comprising appropriate BLM resource specialists would conduct formal monitoring for the physical setting. The resource specialists would determine the frequency of monitoring, but during the first phase, a comprehensive assessment would be conducted for at least 1.5 years following the completion of the RMP to establish baseline data for the seasonal variation in visitation.

Volunteers and BLM field personnel would conduct informal monitoring on a routine basis. Monitoring would occur by performing a visual assessment during normal field operations and implementing a photo monitoring program. If informal monitoring results in resource concerns, an appropriate resource specialist would be notified.

APPENDIX C

Cultural Resources Management Plan

The Sloan Canyon National Conservation Area Cultural Resources Management Plan

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January 2005

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INTRODUCTION

The cultural resources of Sloan Canyon National Conservation Area (NCA) were one of the primary reasons Congress established the NCA in 2002. This appendix provides three key elements for management of cultural resources during the first stage of implementation:

- A cultural context and relevant research questions for archeological and ethnographic work that may be conducted in the early stages of developing the NCA
- A treatment protocol to be implemented in the event that Native American human remains are discovered
- A monitoring plan to establish baseline data and track effects on cultural resources as public use of the NCA grows.

The primary management of cultural resources for the NCA is provided in the Record of Decision for the Approved Resource Management Plan (RMP). These management guidelines provide more specific guidance than standard operating procedures. As the general management plan for the NCA is implemented, these guidelines could change over time as knowledge is gained of the NCA, its resources, and its uses. All cultural resource management would be carried out in accordance with the BLM/Nevada State Historic Preservation Office Statewide Protocol, including allocation of resources and determinations of eligibility. Activity-level cultural resource plans to implement the Sloan Canyon NCA RMP would be developed in the future.

PART I: CULTURAL CONTEXT AND RESEARCH DESIGN

The relationship between cultural resources management and research significance has been defined at three interpretive levels (Hardesty 1995; Hardesty and Little 2000). The first and most basic level is the archaeological context. The archaeological context consists of the field observations of artifacts, features, and other physical remains in spatial relationships to each other and to the environment in which they are found. Contextual information of this type includes descriptions of provenience, associations, and physical matrix; site size and layout, relative abundance and diversity of physical remains, etc. The second level consists of the data required to address research questions derived from middle range theory that links archaeological context to past human activities (e.g., Binford 1980, 1983; Leone 1988; Schiffer 1987). Questions that can be addressed at this level include how sites are formed, how to distinguish different subsistence practices, past environments, population sizes, domestic architecture, and household form and activities. Middle range questions may also include questions of who made the artifacts (ethnicity), what are the artifacts, how were they made (technology), and when (chronology). The third level comprises the data required to address questions derived from general anthropological theory. Questions derived from general theory address issues such as the direction and pace of cultural evolution, historical materialism, and symbolism. The questions posed at this level are derived from theoretical paradigms that reflect the current understanding of the human past in a much broader perspective than an area the size of Sloan Canyon NCA, or even the southern Nevada region. Recent paradigms include such perspectives as cultural materialism, evolutionary ecology, world systems theory, structuralism, symbolism, Marxism, critical theory, and many others. The body of data that is relevant to questions posed under any particular paradigm can vary greatly, but tends to build on results of previous studies. That is, data requirements tend to become more inclusive rather than less inclusive in terms of the kinds of data required to address new questions.

These three levels of significance provide a guide for evaluating the importance of the cultural resources of Sloan Canyon NCA. In a literal sense, all cultural properties are important for addressing questions that can be posed from at least one of the three interpretive levels. But the issue for management of cultural resources in any particular area is whether or not it has potential for containing uninterpreted information. The goal of determining which cultural resources have important information value is to record all cultural properties and preserve a sample of the variety of information adequate for future theoretical, interpretive, and cultural explanations.

Meeting the goal of preserving a sample of the kinds of cultural resources adequate for future research entails preserving a sample of site types containing each category of uninterpreted information. Development of the widespread use of a Geographical Information System (GIS) within the National Register process is one potential way of expediting the recognition of uninterpreted information and revealing data gaps. The other way of recognizing what information is important for future research needs is development of a research design. Data are important and, in many cases, exist only in the context of interpretive frameworks (theories and paradigms). Thus, a research design that links data to an interpretive framework will identify what cultural properties are important. However, what archaeological information is important also depends upon redundancy. That is, at some point the answer to a significant research question requires no additional information, or where each additional bit of information adds very little to the answer (Hardesty 1995). In the following discussion we have attempted to identify broad research questions that remain at the core of most archaeological research in southern Nevada and the kinds of archaeological information that could be found on Sloan Canyon NCA that are important to addressing those questions.

Sloan Canyon NCA is on the boundary of several cultural and environmental regions. The Mojave Desert, the Great Basin Desert, and the Sonoran Desert, each afford a different suite of resources that have contributed to different cultural developments and that respond differently to climate changes. Consequently, the boundaries of prehistoric cultural groups have often been drawn along the boundaries that define the three deserts (which correspond to the boundaries of the distributions of many plants and animals). The basic material culture inventory of the prehistoric peoples in all three deserts exhibits broad similarities, allowing for differences in the native toolstones and other materials available in each area. But for each named prehistoric culture, artifact types have been identified through which the presence of a particular cultural group can be inferred when those artifacts are found. Cultural boundaries have often been defined on the basis of material culture, which has been inferred to reflect adaptation to environment.

Sloan Canyon NCA has the potential to provide cultural resources relevant to addressing a broad spectrum of research questions phrased in terms of current research paradigms. The research questions defined below are divided into seven very broad categories following Duke et al. (2004) (with the addition of a historic research theme). While the questions posed below provide a guide for assessing the importance of cultural resources known and expected in Sloan Canyon NCA, given our current understanding of the prehistory and history of North America in general, and Sloan Canyon NCA in particular, it must be recognized, as Hardesty has noted, "Research questions...change as new information and theories emerge. For these reasons, evaluating the information potential of archaeological properties requires tracking the dynamics of scientific and other scholarly research" (1995:7).

Archaeological studies in southern Nevada and surrounding regions have revealed the presence of people since at least the end of the Pleistocene and continuing into the present in a chronological sequence that currently has few, if any, temporal gaps when the region is viewed at a broad scale. The chronology and content of the archaeological record have been summarized and interpreted in numerous publications from a variety of theoretical paradigms appropriate for the time of their publication including, but by no

means limited to, Grayson (1993), Lyneis (1982a, 1982b), Warren and Crabtree (1986), Schaafsma (1986), Madsen (1986), and Pippin (1995). A theme that is pervasive in the interpretation of prehistoric archaeological sites in the Great Basin, including the Mojave Desert and immediately adjacent parts of the Desert West, is the relationship between people and their physical environment. This theme has its origins in the early work of Julian Steward, particularly his seminal volume Basin-Plateau Aboriginal Sociopolitical Groups (1938). Steward (1929) also completed the first systematic study of Nevada's rock art, rejecting the idea that it was a form of "art for art's sake" and instead argued that it was the residue of culturally meaningful practices in the past. Steward's study was influential in shaping the terminology used to characterize abstract imagery, as well as identifying the important research theme of the balance between schematic and naturalistic imagery in rock art assemblages as a characteristic of stylistic variation.

Starting from interpretation of the distributions of cultural groups on the basis of their use of natural resources, many subsequent studies have focused on developing a more detailed and accurate understanding of prehistoric, ethnohistoric, and historic distributions of cultural groups through time and their relationships to natural resources, and causes of change in the lifeways of different groups at different times. Many of the sources of cultural change that have been identified in the many studies since Steward's initial study are environmental, particularly climatic change and associated changes in the plant and animal resources used by people. But other changes entailed the relationships between indigenous groups and their neighbors, either in the sense of diffusion of important technologies (i.e., horticulture) or incursions of people(s) from adjacent areas. Because these mechanisms (climate change, diffusion of technology or migration of people) have been interpreted as the primary causes of cultural change, the chronology of the region has largely been structured around these events. A very brief synthetic summary of the southern Nevada cultural chronology as it relates to the Sloan Canyon NCA is presented in Table 1. Also included in Table 1 are one or more of the broadest research questions for the time periods defined. For the most part the questions in Table 1 address the issues that were considered in distinguishing the time period from preceding and succeeding periods. These are questions posed at both middle and general levels of theory that will help define what kinds of data at the level of archaeological context are important and should be considered in evaluating the eligibility of sites for the National Register of Historic Places. More specific questions relating to Sloan Canyon NCA are posed in the following text.

Most of the archaeological record for southern Nevada is a record of Archaic hunter-gatherers. The Archaic Period was preceded by a poorly known Paleoarchaic, and possibly even a Paleoindian Period. The earliest inhabitants of southern Nevada may have arrived as early as the end of the Pleistocene (ca. 10,000 BP), but the few artifacts that suggest their presence are generally isolated surface finds that cannot be securely dated, and there is not yet enough data to determine much about their lifeway in terms of subsistence, land-use, or other cultural behaviors. The primary research questions for this period address whether there was a single population of people represented by each of the distinctive projectile point types (fluted points and the various large stemmed point types), or if the different point types represent task specific technologies; and whether people focused on lake-margin resources, large game, or were already relying on the generalized use of resources as they became available in the environment (Basgall and Hall 1991; Jones and Beck 1999). Evidence of this period is usually found in areas where water was present, especially along ancient shore-lines (Campbell and Campbell 1935) making it unsurprising that no evidence has yet been found in the Sloan Canyon NCA given the lack of such water sources in the area. However, this may be a sampling bias as sites identified to this period have been found along a wash near Yucca Mountain (Pippin et al. 1984). Any artifacts relating to the Paleoindian/Paleoarchaic Period found in Sloan Canyon NCA would provide important information regarding this early and controversial period in southern Nevada.

Table 1. Cultural Sequence and Context for Southern Nevada Focused On the Area of Sloan Canyon NCA

Period	Time Range (in years BP)	Environments	Identifying Characteristics of Assemblages	Some Important Research Issues
Historic	150—present	Mechanical rather than climatic changes in the environment caused by mining, transportation routes, introduction of domestic livestock, and larger settlements	Artifacts of Euro-American manufacture and land alteration associated with activities such as mining (adits, shafts, etc.), transportation (i.e., roads), etc.	What has the impact of various activities associated with Euro-American settlement been on the local environment and the people who lived there before?
Ethnographic		Essentially modern	Southern Paiute, Chemehuevi, Mohave	Issues related to Native American perspectives and world view. What do particular places and activities mean to different tribal groups?
Numic	700—present	Essentially modern	Arrow-sized projectile points of the Desert and Cottonwood series	Were the Numic immigrants from the west or local people? Did they displace the horticultural Puebloan peoples or simply remain after horticulture was no longer practical? What environmental perturbations affected horticulture?
Ceramic/ Saratoga Springs	1500—contact	Essentially modern	Arrow-sized projectile points of the Desert and Cottonwood series; ceramics of Paiute, Puebloan and Patayan styles; evidence of Puebloan influence in house structures	When and why did the various cultural/ethnic groups arrive in southern Nevada? How did the various cultural/ethnic groups identified by different ceramic styles differ in their land/resource use patterns? What was the nature of interactions between/among these groups?
Middle Archaic/ Gypsum	4000—1500	Return to less xeric conditions	More varied medium-sized dart points of the Elko, Gypsum, and Humboldt series; increase in millingstones, larger sites	Was there a shift in residential settlement to a greater focus on specific locations rather than short-term occupation of general areas as before? Is the increase in biface production and the occurrence of non-local toolstone a reflection of trade, relocation of villages, or logistical foraging?
Early Archaic/ Pinto	8000—4000	Environmental drying	Pinto-type points, millingstones, curation and reuse of tools	Does this period overlap with the preceding period indicating an in situ shift in land-use patterns in response to environmental drying that reduced the distribution and abundance of previously used resources requiring a shift to greater reliance on small seeds?
Paleoindian/ Paleoarchaic Lake Mojave	Prior to 8000	Late Pleistocene fauna, lacustrine and riverine features	Fluted points, large stemmed points, crescents, steep-sided unifaces or scrapers	Were people focused on lake-margin resources, large game, or already relying on generalized use of resources as they became available in the environment?

Until the last decades the Archaic period was characterized as very long period of time during which there was no cultural change (Jennings 1957), which led to many researchers recognizing the major question for this long time period to be "...are there large-scale directional trends and changes that characterize this period?" (Lyneis 1982a:167). Cultural changes during the Archaic are generally characterized as responses to environmental change, and differences between areas are characterized as responses to environmental variability with flexible subsistence strategies regardless of whether the explanatory model in which interpretation is framed follows the lead of Steward's (1955) Cultural Ecology theoretical framework or the newer evolutionary ecology models (e.g., Bettinger and Baumhoff 1982). Flexible subsistence strategies also allow a population to accommodate short-term fluctuations in availability of plant and animal foods. More detailed knowledge of environmental conditions and the archaeological assemblages for time periods during which recognizable environmental conditions prevailed has allowed recognition of a tripartite cultural sequence for the Archaic Period in southern Nevada as shown in Table 1. The division is, however, a generalized pattern recognized over a broad area and may or may not be visible in localized areas such as Sloan Canyon NCA. Any archaeological resources that allowed recognition of fine-scale chronology within the Archaic Period would clearly qualify as important.

The Archaic Period essentially ends with the appearance of a number of material culture innovations, many or most of which originated in adjacent areas. Ceramic vessels of Puebloan and Patayan styles are the most common archaeological evidence the marks the end of the Archaic, but the appearance of ceramics is often accompanied by evidence of horticulture and changes in house structure. Sherds of ceramic vessels are commonly dated by reference to chronological sequences developed from sites in the Southwest. Artifacts that can clearly be affiliated with a cultural tradition from an adjacent region (i.e., the Southwestern ceramic traditions) provide important information regarding cultural interactions and chronology.

The arrival of peoples in the Great Basin speaking languages belonging to the Numic language family is thought by many to have occurred sometime around 700 BP (Warren and Crabtree 1986), though the exact timing is a matter of debate, as is what artifacts can be used to identify the Numic groups (Madsen and Rhode 1994). Numic groups are generally characterized as broad-spectrum foragers who used a greater range of resources that were more costly to collect and process than the larger game Archaic groups are thought to have relied on (Bettinger and Baumhoff 1982). Although various attempts to explain the relationships between Archaic, Numic, Puebloan, and Patayan groups have been proposed, the relationships between and among these peoples remain unclear. Consequently, any site with artifacts that can clearly be affiliated with one or more of these groups (again, potsherds are most frequently the artifacts by which the groups are recognized, but other artifacts may also be relevant) are important sources of information regarding population interactions and movements.

Class II and III inventories have already been conducted in the Sloan Canyon NCA (Duke et al. 2004; White 1998). The surveys provided a sample of the archaeological resources that occur in the NCA. Prior to conducting their archaeological inventory of the NCA, Duke et al. (2004) developed a research design that identifies six major categories of research issues that can be addressed with data from archaeological resources in the Sloan Canyon NCA. The six categories of research questions include: 1) chronology of human presence in the area; 2) land-use in marginal environments; 3) technological organization; 4) population interactions and replacements; 5) rock art; and 6) current Indian perspectives (Duke et al. 2004). We have also added a seventh: research issues for the historic period. The following research questions are based on the findings and recommendations reported from the survey (Duke et al. 2004) and ethnographic studies conducted at the same time (Bengston 2004). However, because environmental change is generally seen as the triggering mechanism of cultural change in most theoretical models of culture change in the Desert West, evidence of environmental change is important to addressing literally all archaeological and ethnographic research questions. Thus, environmental studies, particularly those that address environmental change as well as distributions of resources, are included

here as an underlying research category. Pollen, plant macrofossils from woodrat middens, faunal remains from woodrat middens, paleontological and archaeological sites, are critical sources of information that underlie most explanations of archaeological phenomena, and should be recognized as of high archaeological importance whether they are associated with cultural materials or not.

1. CHRONOLOGY: HOW LONG HAVE PEOPLE BEEN USING SLOAN CANYON AND THE NORTH MCCULLOUGH RANGE?

Determining the age of archaeological materials is a necessary first step in the interpretation of individual archaeological finds, synthesis, and regional interpretation. The currently available sites, assemblages, and artifacts from Sloan Canyon NCA for which age has been estimated indicate people have been using the area only during the late prehistoric and historic periods (Duke et al. 2004). However, the archaeological record elsewhere in southern Nevada has provided evidence that people were present as early as the end of the Pleistocene (approximately 10,000 years ago) and have been continuously present in varying numbers and habitats in the region for the entire Holocene (Grayson 1993; Pippin 1995).

Determining the chronology of use of any area in the Intermountain West is difficult due to the paucity of materials from which age of artifacts, and by association assemblages and sites, can be determined. The preferred material for dating is anything organic from which age can be estimated by radiocarbon analysis. Radiocarbon analysis is the preferred dating method because many of the issues with other dating methods are well known and have been addressed; most laboratories that do radiocarbon analyses have standardized ways of dealing with contamination, calibration, and other sources of error. Consequently, placing new archaeological materials into an existing regional sequence is relatively straightforward. Unfortunately, organic materials amenable to radiocarbon analysis are rare outside caves and rockshelters in most parts of the Intermountain West, including Sloan Canyon NCA. One of the most important issues that should be addressed in future archaeological studies in Sloan Canyon NCA is determination of whether the apparently short period of human presence is real or a result of taphonomic processes that have effectively hidden all earlier evidence. Because organic materials do not preserve well outside the protected environments of caves and rockshelters, it is important that all such locations that contain the potential for recovery of stratified artifact assemblages with associated organic materials be preserved for archaeological investigations.

Other methods of determining the age of archaeological materials are less precise and have sources of error that are not as well known and do not have standardized protocols for assessing errors and calibrating for their effects. These methods, however, have been used to determine the relative placement of the Sloan Canyon NCA archaeological record into the local and regional sequence. Methods that have yielded useful chronologies in southern Nevada include artifact typologies and obsidian hydration analyses.

Artifacts that have been classified into the most useful types for chronology building are projectile points and pottery, but even the presence of ground stone is often used to provide a gross estimate of the age of a site. Importantly, the typologies for both projectile points and pottery were developed in areas outside southern Nevada, in environmentally different settings where there is no reason to believe cultural development proceeded at the same pace or in the same directions as in Sloan Canyon NCA. The projectile point chronology was developed in the western Great Basin (Heizer and Hester 1978; Thomas 1981) where lakes and marshes were abundant throughout most of the Holocene, and contact with peoples on the west side of the Sierra Nevada clearly was common. A similar typology has been developed for

the eastern Great Basin (Holmer 1986). Differences between the western and eastern projectile point chronologies attest to the necessity of developing a similar sequence for the southern Great Basin-Mojave Desert area. The pottery typologies were developed in the Southwest where both dry land and irrigated agriculture was possible and contact with peoples of Mesoamerica occurred. Because both the subsistence technology of a people and their contact with neighboring peoples can greatly affect the material culture inventory and its stylistic attributes, there is no reason to believe that the currently available dates for individual projectile point types or pottery styles are directly applicable to the archaeological record for Sloan Canyon NCA.

Obsidian hydration is a method of assessing the relative age of artifacts made of volcanic glass and has been investigated in various parts of the Intermountain West for a number of years, with varying degrees of success. It has been viewed as having great promise for archaeological studies because it could potentially be used on any piece of obsidian that was clearly broken by people; not only formed tools such as projectile points but debitage and assayed cobbles as well. However, numerous studies have shown that obsidians from different sources have different hydration rates, and that hydration rates of obsidian from the same source will vary depending on the immediate conditions of the environment in which it has lain since it was broken. Therefore, before obsidian hydration can provide a useful source of age determinations for the Sloan Canyon NCA artifacts, a local sequence for the common obsidians must be developed. Obsidian studies should be encouraged as a means of obtaining temporal data (via hydration analysis) that can provide age estimates of events in the NCA, and the movement of people (via XRF analysis), as in many parts of the Desert West chronologically sensitive materials are rare.

Prehistoric pottery offers another, extremely useful, source of chronological data for archaeological sites where materials amenable to radiocarbon analysis are not present. For the most part the chronological data comes from stylistic traits of the pots. However, in Sloan Canyon NCA the absence of residential sites makes it unclear whether pottery was being made locally or transported from some distance, which begs the issue of time-lag in estimating the age of sites based on typologies of ceramic styles developed from other areas. Knowing the source of the pottery's clay could provide essential data for tracking population movements and calibrating the age estimates based on stylistic sequences from other areas where pottery is abundant. Neutron activation analysis studies of the fabric of pottery sherds and clay sources in and around Sloan Canyon NCA should be encouraged to address the issue of where pottery was being made.

Developing and testing additional methods of assessing the age of archaeological materials found in desert environments is a topic that should receive attention in future archaeological research projects. Some promising methods include optical luminescence of sediments containing archaeological materials, and growth ring analysis of desert shrubs found in deposits and growing on sites. Petroglyph dating is particularly challenging for rock art chronometric studies. The thematic research design described later in this Appendix for rock art reviews current methods most likely to apply to Sloan Canyon NCA and their data needs (Table 2).

2. LAND-USE: WHAT KINDS OF ACTIVITIES BROUGHT PEOPLE TO SLOAN CANYON AND THE NORTH MCCULLOUGH RANGE?

Most prehistoric peoples of the Intermountain West were mobile foragers. They moved seasonally to areas where the greatest abundance of food resources could be found. However, small groups would also travel significant distances to sources of materials necessary for making tools (lithic quarries), and

possibly to sacred places as well. Sloan Canyon NCA contains a variety of different landscape types. Each affords a different suite of resources that could potentially have attracted prehistoric peoples. The archaeological survey already done has provided baseline information regarding use of the different landscape types.

Although the currently available survey data provide a reasonable assessment of prehistoric land-use in Sloan Canyon NCA for the last 1500 years, the archaeological potential of area has barely been tapped. Given the rugged formation of the North McCullough Range, the possibility that unrecorded caves and rockshelters exist is significant. Such sheltered sites could provide important data for both chronology building (see above) and for reconstructing past land-use patterns, particularly in regard to subsistence activities, procurement of tool materials, and sacred activities. Sheltered sites throughout the Great Basin have yielded cached tools (nets, fish hooks, grinding stones) and objects of inferred ceremonial significance (e.g., feather bundles) (Jennings 1957; Loud and Harrington 1929). Nearby Gypsum Cave (Harrington 1933) contained a number of arrow shafts that, while not as old as originally thought, provide evidence that prehistoric people were visiting the cave and using it as a place to store hunting equipment that they did not immediately need, but had prepared in anticipation of future needs. Sheltered sites in Sloan Canyon NCA could provide critical data for reconstructing past lifeways.

Sheltered and buried sites can also provide invaluable evidence of past land-use practices in the form of faunal and floral remains. Although these organic materials are seldom found during inventory, the potential for them is often noted in areas where there is the potential for deep deposits that can contain them. Excavation at sites that have potential for having deep deposits recorded during inventory (Duke et al. 2004) could also provide evidence of human presence prior to the well-documented 1500 years found on the surface.

Other evidence of land-use can be found in the simple distribution of particular kinds of sites in different habitat types. Although three of the types of sites in the Duke et al. (2004) typology, and isolated finds in general, are not considered eligible for listing on the National Register of Historic Places, the mere occurrence of archaeological materials is critical information for developing an understanding of land-use through time.

3. TECHNOLOGICAL ORGANIZATION: WAS TECHNOLOGY ORIENTED TOWARD THE LOGISTICAL REQUIREMENTS OF TIGHTLY SCHEDULED, PLANT-FOCUSED SUBSISTENCE ACTIVITIES?

Throughout the Great Basin, in fact throughout the Intermountain West, late-period sites are more abundant than earlier sites, and late-period assemblages reflect greater use of seasonal resources through the more common occurrence of ground stone implements (i.e., milling stones and handstones assumed to have been used to grind seasonally available seeds) and reduced frequencies of hunting related tools (i.e., projectile points, debitage, and other flaked stone tools assumed to have been used to hunt rabbits and artiodactyls). Important research questions that should be addressed in future archaeological projects in Sloan Canyon NCA regarding the use of different technologies are:

- Whether the differences are temporal (i.e., more hunting tools in earlier sites, more grinding tools in later sites)

- Whether different technologies are found in different, but contemporaneous, settings characterized by different edible resources (i.e., more hunting related tools in the McCullough Range where mountain sheep are more abundant, more milling stones in the canyon where there are more edible plant resources)

- Whether different technologies are found in different, but contemporaneous settings characterized by different toolstone resources (i.e., more chipped stone hunting tools and debris near quarries where knappable stone could be obtained, more ground stone implements near sources of appropriate materials for grinding)

Three important, and closely related, issues must be addressed before the differences in technologies can be interpreted in terms of human behavior. First, because datable materials are rare in almost all sites, are sites with milling stones in the artifact assemblages being identified as late-period sites due to the presence of the milling stones? If so, the reasoning that milling is a late-period technology that replaces an earlier emphasis on hunting is circular. Sites hypothesized to be late because they contain ground stone implements must be independently dated using a method other than typological similarity to ground stone tools dated elsewhere to the late period. Radiocarbon analysis of plant materials floated from the matrix in which milling stones are found is one possibility for obtaining an independent date. Association with other typologically datable artifacts (i.e., potsherds, projectile points) is another (see previous research issue for more detailed discussion of dating issues).

Second, because early sites are rare, does the distribution of early sites reflect the manner in which people used the landscape, or is the known distribution of early sites biased by the likelihood of archaeological discovery or geological processes that have allowed sites to be relatively well preserved in some environments, poorly preserved in others, and completely erased in still others? Because late sites with milling technology tend to occur in depositional environments where sediments are deep enough to permit growth of plants that can be harvested for their seeds, and hunting sites are more likely to be dispersed in more rugged uplands where animals such as bighorn sheep are more likely to be found, hunting sites are more vulnerable to dispersion by natural processes and are less likely to be recognized during a sample inventory. If they occurred in the intervening valleys and drainages they are likely to be buried by the sediments that accumulate in lower elevation settings.

Third, most datable sites found during inventory are late-period sites. It is reasonable to assume the resources available in the environment today are representative of those available to the prehistoric inhabitants of the area. However, recognizing that there may have been earlier use of the area, it is important to know the environmental changes that have occurred, especially those that affected important prey animals and plants that produce edible seeds, and which resources were being used most frequently at different times.

4. POPULATION INTERACTIONS AND MOVEMENTS: CAN DIFFERENT ETHNIC GROUPS BE RECOGNIZED IN THE ARCHAEOLOGICAL RECORD OF SLOAN CANYON NCA AND THE NORTH MCCULLOUGH RANGE?

The origin of Great Basin peoples has been a significant research issue for archaeologists since the early 1920s when it was first recognized that the New World had a long prehistoric period, and that prehistoric peoples differed from the ethnographically recorded peoples of North America. The relationships of Great

Basin peoples with peoples from adjacent regions have also been important issues for archaeologists and ethnologists as culture areas began to be defined. Incursions of people from both the Southwest (Puebloan and Patayan) and from southern California (Numic) have been hypothesized for the late Holocene in the southern Great Basin. It commonly assumed that the horticultural people from the Southwest left when climatic conditions returned to more xeric conditions and dry land farming was no longer tenable, leaving the region once again to Numic peoples, descendants of whom remain in the region today.

The hypothesized population replacements and incursions lead to three interrelated issues for understanding the prehistory of Sloan Canyon NCA: 1) what archaeological evidence will allow recognition of the different groups, and do those kinds of evidence occur in Sloan Canyon NCA? 2) Did the population shifts really occur, or are artifacts generally associated with non-native cultures evidence of trade rather than population movements? 3) If the population replacements occurred, what gave one group of people a competitive advantage, or did two or more cultural groups coexist during times when there were population incursions from adjacent regions?

Data from the inventory provide generally accepted evidence that different cultural groups may, in fact, have been present in the Sloan Canyon NCA, although most of the archaeological record in the area is characteristic of much of the archaeological materials found throughout the Holocene in the Great Basin and during the Archaic Period in the Southwest. Three kinds of artifacts indicate extensive trade or population movements: pottery sherds (generally associated with Puebloan and Patayan cultures from the southwest, as well as the indigenous Southern Paiute brownware); obsidian (has been identified from widespread sources); and beads (made from Olivella shells that live in coastal water, but are found in Californian sites to the west, Hohokam sites to the east, and Great Basin sites to the north).

5. ROCK ART: WHO MADE THE ROCK ART IN SLOAN CANYON AND ELSEWHERE IN THE NCA, WHEN AND WHY?

Specific stylistic issues that relate to the ethnic identity of the prehistoric peoples who created rock art (particularly the emergence of Fremont and Puebloan cultural systems, and the dispersal of the Numic language family) have been discussed by Bettinger and Baumhoff (1982), Quinlan and Woody (2003), Schaafsma (1980, 1994), and Turner (1963).

Social Functions and Symbolism—The first systematic study of Nevada's rock art was Steward's (1929) analysis of the spatial distribution of rock art styles and themes in California, Nevada and Arizona. Steward (1929:225) rejected the idea that Nevada's rock art was a form of "art for art's sake" and argued that it was the residue of culturally meaningful practices in the past, although its precise meanings and functions were unclear. Steward's stylistic analysis was influential in shaping the terminology used to characterize schematic imagery, as well as identifying an important research theme—i.e., the balance between schematic and naturalistic imagery in rock art assemblages as a characteristic of stylistic variation. This stylistic classification was subsequently elaborated by Heizer and Baumhoff (1962), who added a temporal dimension, and has remained in broad use, despite some critique (e.g., Hedges 1982), minimally shaping researchers' general terminology and chronology. The relative balance between representational and abstract imagery is still used to define style types and has implications for understanding the social functions and interpretation of rock art (Bradley 2000; Layton 2000; Quinlan and Woody 2003).

The interpretation of rock art social functions and symbolism is characterized by divergent theories and opinions, in part because of the lack of direct ethnographic information relating to its production and uses (Quinlan 2000; Quinlan and Woody 2003). The rock art of Nevada has been interpreted from the general standpoint of hunting magic (Heizer and Baumhoff 1962), shamanistic (Whitley 1994), and landscape approaches (Woody 2000).

Rock art sites within the Sloan Canyon NCA may have considerable research potential to address questions of social structure, ritual, ethnicity and land-use in the Archaic, Puebloan and Fremont, and Prehistoric periods (Duke et al. 2004; Holmes et al. 2002:6; Lyneis 1982; White 2002:10). Themes, content, style and landscape context, all inform questions of site function and past meaning. Landscape context and portrayal of game animals can be used to determine whether Sloan Canyon's rock art is associated with hunting strategies, in the form of hunting magic (Heizer and Baumhoff 1962) and/or to educate young hunters about game animals (Matheny et al. 1997; Mithen 1988). Domestic archaeology and evidence of the daily routines of hunter-forager life occurring in association or close proximity to rock art sites could indicate that it was used in community-wide social practices (Quinlan and Woody 2003). As rock art interpretation has been skewed by the under-reporting of rock art's domestic associations, this spatial patterning at Sloan Canyon NCA offers an important corrective (Duke et al. 2004). Identifying prehistoric scratched art that defaces earlier rock art has been used to recognize the spread of Numic peoples through the Great Basin (Bettinger and Baumhoff 1982). Sometimes scratched art seems to embellish earlier art and may have been intended as a form of retouching (Woody 1997, 2000). Dating the advent of scratched art and its possible function as later retouching are important research themes rarely addressed in Great Basin rock art research because of the lack of data of sufficient quality. In addition, a qualitative and quantitative analysis of the themes and styles of Sloan Canyon NCA rock art imagery could address the expression of prehistoric ethnicities because of the ways cultural identities are potentially expressed through graphic arts (Layton 2000:179-181). Such data would also be of value for making evaluations of significance of rock art panels and/or sites.

Dating Rock Art—Estimating the age of rock art is important for establishing a panel's entitlement to protection under ARPA and other statutes, and is an important research issue in its own right. Although it is sometimes claimed that only direct dating provides the kind of evidence accepted in court for age determinations, this is not necessarily the case. Nearly all scientific dating techniques applied to petroglyphs are experimental and likely to be challenged as such in court. However, traditional stylistic dating techniques, whilst providing relative dates and broad estimates of age have been accepted in court cases trying ARPA violations of rock art in Nevada (Woody 2005).

Scientific (or direct) dating techniques usually require intrusive extraction methods, even if only microscopic quantities are required for analysis (Table 2). Therefore, their application usually requires consultation with Native American tribes. These techniques are expensive and only pinpoint maximum and minimum dates for the rock art design tested, rather than the assemblage as whole. In contrast, relative dating techniques are non-intrusive and relatively cheap to perform (Table 2). They only produce broad age estimates and general sequences of development. They are simple to apply, often requiring only a keen sense of observation and the recording of visual levels of repatination using a Munsell rock color chart. They have the significant advantage of paying careful attention to the physical condition of rock art motifs, reporting data useful for making an assessment of potential site impacts.

Duke et al (2004:120) used relative dating techniques to suggest that the rock art sites within the Sloan Canyon NCA date from the Middle Archaic into the ethnohistoric past. Their assessment is based on the visual appearance of repatination, themes portrayed in rock art, and archaeological evidence dating the occurrence of other activities in Sloan Canyon NCA. A general temporal sequence is proposed based on the growing frequency of representational motifs with time (2004: Table 42). Further study and the

inclusion of the rock art from the main Sloan Canyon Petroglyph site (26Ck2420/2621) in analysis has the potential to further refine this relative chronology.

Table 2. Rock Art Dating Methods and their Possible Relevance to Sloan Canyon NCA.

Method	Comments	Sources
Direct Dating Methods		
1) Radiocarbon analysis of mineral accretions (and/or their inclusions) that cover rock art	Provides minimum and maximum ages and has been used to date organic inclusions in desert varnish; it may have potential at Sloan Canyon NCA	Bednarik (2001, 2002); Watchman (1996, 2000)
2) Lichenometry—a calibrated dating technique using lichen growth rates to estimate ages	Rarely used, is only precise up to 500 years, and only provides minimum and maximum age estimates	Bednarik (2001, 2002)
3) Microerosion analysis—attempts to quantify weathering effects that can only be identified microscopically	Its use is restricted to erosion-resistant rocks, its accuracy is currently poor, and has rarely been used	Bednarik (2001, 2002)
4) AMS dating of organic materials contained in the residues of paint pigments	Its extraction techniques are intrusive and pictographs are rare at Sloan Canyon NCA	Chaffee et al. (1993); Watchman and Cole (1993); Watchman and Lessard (1993)
5) Cation-ratio dating—attempted to calibrate the leaching of soluble cations of rock varnish relative to the supposedly stable titanium content	This technique has now been abandoned by its inventor and never produced any accepted dates	Dorn (1983, 1996); Watchman (1992)
6) Cosmogenic radiation nuclides—determines maximum rock exposure ages by measuring the presence of cosmic ray-caused radiation products in rock	Does not actually date rock art, is poorly calibrated, and has produced unreliable results when applied to archaeology	Bednarik (1998)
7) X-Ray Fluorescence dating—an experimental method that measures the chemical thickness of desert varnish to produce an age estimate	Each site tested requires individual calibration. It is non-intrusive and is a practical way of testing all the designs at a site. Could be of potential for Sloan Canyon NCA	Lytle et al. (2004)

Method	Comments	Sources
Relative Dating Techniques		
1) Iconographic dating—dates rock art by identifying dateable subjects in its imagery	Restricted to representational designs and is most useful for dating contact period and post-contact period imagery—one way of identifying graffiti	
2) Stylistic dating—observable differences in style are related to different times or cultural identities	Useful for broadly determining the age and general sequence of rock art assemblage, but stylistic differences are also functional and therefore can not be simply equated with ethnic identities or chronological periods	Layton (2001:315); Ucko (1987)
3) Technique—useful for identifying graffiti produced with modern tools and materials (e.g., spray paint, knives)	The limited range of techniques that exist to make rock art may have been in contemporaneous use and so can not be used to estimate the age of prehistoric art	Bednarik (2001, 2002)
4) Excavation—estimating the minimum age for rock art that is covered by datable deposits (either through exfoliation or sedimentation)	Provides a terminus ante quem for rock art that is covered or has exfoliated into the dateable deposit. No such cases have been	Cannon and Ricks (1986); Ricks and Cannon (1993)

Method	Comments	Sources
Relative Dating Techniques		
	reported for Sloan Canyon NCA	
5) Proximity to other archaeological resources—provides potential evidence of rock art's continuing use even if it does not date the act of production itself	Relates rock art's use-life to other activities—it only provides the most general indications of rock art's age	Bradley (2000); Quinlan and Woody (2003)
6) Visual appearance of weathering and/or repatination—allows broad age estimates to be made—it is best used in combination with superimpositioning	This method could be used at Sloan Canyon NCA as superimpositioning and differences in levels of repatination are visually apparent	
7) Superimpositioning—discriminates older from more recent motifs, allowing a general sequence to be delineated	Works best when combined with a consideration of visual levels of weathering/repatination	Woody (1997)

Motif Typology/Key—To facilitate recording, evaluation and quantitative and qualitative statistical assessment of the rock art sites contained within the Sloan Canyon NCA, it is suggested that a motif typology or key is developed. The typology used by Duke et al. (2004) should serve as the basis of such a motif typology but with modifications and expansion as necessary (see also Nevada Rock Art Foundation 2003 [NRAF]). In constructing such a motif typology, interpretive labels should be avoided for all but the most readily identifiable subjects portrayed in a representational or naturalistic manner. This motif typology will enable rock art site types to be more securely defined and allow land managers to prioritize protective and conservation measures accordingly. Anthropomorphic and zoomorphic types should be subdivided into naturalistic and schematic types (allowing Basin and Range Tradition style simple stick figure types to be discriminated from elaborate Puebloan or Fremont-style types etc.).

Tortoise Cairns—(Duke et al 2004:107) reported the discovery of two human-made tortoise/turtle cairns located on a possible prehistoric trail on the rim of the canyon in Middle Canyon II. These are a unique feature, not represented elsewhere at Sloan Canyon NCA, or anywhere else in Nevada. Further research should attempt to elucidate the age of this unique feature. They were not observed in a previous survey that reported the trail they are located on as probably modern (White 1998) raising the possibility that they are a recent addition. Examination of previous survey photography or old tourist photographs may help resolve their age. If they are found to be modern it should be considered whether to dismantle these cairns to discourage copycat cairn construction and restore the site to its original condition.

6. ETHNOGRAPHIC CULTURAL LANDSCAPE

The ethnobotany, rock art, sacred lands, and lifeways of Native American people who used the area are not well documented. Some Native Americans believe the land, including that of the Sloan Canyon NCA, is alive. The Indians living near Sloan Canyon NCA have rituals, songs, and other activities that are associated with the land in general. A Chemehuevi elder commented, "It seems awkward to put these things in writing; however, it is important to document that the place has been visited and should be preserved." The collection of this information would greatly enhance the Bureau of Land Management's (BLM) ability to focus on Native American interpretation of the NCA. It would also aid the BLM in continuing consultation with the tribes throughout the RMP/EIS process and in the ongoing management of resources within the NCA (Bengston 2004). Some potential areas that could be incorporated into an overall ethnographic cultural landscape study of the Sloan Canyon NCA include: ethnographic/ethnohistoric study of the North McCullough Range within the boundaries of the Sloan Canyon NCA, an ethnographic study of the Sloan Canyon Petroglyphs Site (26Ck2420/2621), focusing

individually on the Southern Paiutes, Chemehuevis, Mojaves, Hopis, and Hualapais; and an ethnobotanical study of Sloan Canyon proper, focusing on the Southern Paiutes.

7. RESEARCH ISSUES FOR THE HISTORIC PERIOD

The historic period in the Great Basin is marked by a number of colorful and adventurous themes including trail blazing, mining, and railroad building. Associated industries included the introduction of domestic stock (particularly sheep and cattle) to support the other historic activities, and development of other businesses that grow up around mining, railroads and stock-raising communities. In Nevada, these businesses routinely included saloons, casinos, and brothels. Although there are numerous sites attesting to all of these activities nearby in southern Nevada, the only historic resources recorded during inventory (Duke et al. 2004) related to mining: numerous mining claim cairns and a small group of prospects, adits, shafts, habitation features, and road traces attributable to the Quo Vadis Mine which was in limited production in 1915, a placer mine at the south end of the central valley, an historic road, and a series of concrete dams built in 1942. No evidence of other historic activities was recorded. Future research should pay special attention to documenting other early historic activities in the area that could reflect other uses of the area by non-Indian peoples and the consequent interactions between Indian and non-Indian populations.

PART II: A TREATMENT PLAN FOR HUMAN REMAINS AND ITEMS OF CULTURAL PATRIMONY

Burials, associated funerary objects, sacred objects, and objects of cultural patrimony are often present in areas such as the Sloan Canyon NCA, and are of particular concern to local, living Indian peoples as well as being an important record of the presence of people in the area in the past. Their physical remains and any material culture associated with them provide evidence of many aspects of prehistoric lives. Burial places are broadly defined by the Department of the Interior Interagency Resources Division as "a location where the dead are prepared for burial or cremation, or where the remains of the dead are placed" without restriction on the size of the location or the complexity of the site, including the number of individuals interred or otherwise represented. Objects directly associated with burials, objects that at one time were associated with burials, sacred objects (items needed for the practice of traditional religion) and objects of cultural patrimony (objects that have ongoing historical, traditional, or cultural importance central to the Indian tribe itself, rather than to an individual tribal member) are included in the guidelines for treatment of human remains (Potter and Boland 1992:1-2).

Concern of Native Americans regarding the appropriate and respectful disposition of burial remains and objects has led to the passage of the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA, P.L. 101-601), which defines the rights of Indian Tribes and Native Hawaiian organizations regarding human remains, funerary and sacred objects, and other culturally significant objects for which they can demonstrate lineal descent or cultural affiliation. NAGPRA is intended to protect Native American graves and their related items and to control their removal. It encourages avoidance of archaeological sites that contain burials and makes Federal agencies responsible for consulting the appropriate tribes when such sites are encountered during planned excavations or inadvertently.

Although legislation exists, particularly in NAGPRA, regarding the protection and disposition of burials and objects associated with them, detailed guidance on identifying, evaluating, and documenting archaeological sites that contain burials and appropriate methods for studying them have not been issued. Burial places are recognized as reflections of cultural values and practices that contain important information about past people. Objective evaluation is not always possible because burials are often viewed with reverence and sentiment by families and cultural groups descended from the interred individuals. Consequently, special requirements are included in the evaluation of cemeteries and graves. Burials are not considered eligible for the National Register of Historic Places unless they meet special requirements. The specialized nature of investigation of burials, ongoing debates over the appropriate treatment of burial sites, and evolving policies and procedures relating to NAGPRA have all contributed to the lack of standardized guidance.

The complexity of the issue of treatment of human remains and items of cultural patrimony is vividly expressed in the statement of the Society for American Archaeology (1999) concerning the treatment of human remains. The SAA board adopted a formal statement regarding the treatment of human remains in May 1986 and reaffirmed it in March 1999. The SAA, like the DOI, opposes a Federal legislation that imposes a uniform standard for determining the disposition of all human remains due to the diversity of beliefs and interests in burial customs. The SAA acknowledges an ethical responsibility to advocate and aid in the conservation of archaeological data, recognizing that mortuary evidence is an integral part of the archaeological record that informs directly upon social structure and organization, and upon aspects of religion and ideology. They further recognize that human remains provide unique information about demography, diet, disease, and genetic relationships among human groups. In the statement it is argued that "research in archaeology, bioarchaeology, biological anthropology, and medicine depends upon responsible scholars having collections of human remains available both for replicative research and

research that addresses new questions or employs new analytical techniques." However, the SAA also recognizes the diversity of cultural and religious beliefs regarding the treatment of human remains and that there are legitimate concerns about the treatment and disposition of human remains that conflict with legitimate scientific interests, and that those concerns must be recognized and respected. As with the DOI guidance for consultation with tribes, the SAA encourages close and effective communication between researchers and those communities that may have biological or cultural affinities to human remains. Conflicting claims concerning proper treatment and disposition of particular human remains must be resolved on a case-by-case basis through consideration of the scientific importance of the material, the cultural and religious values of the interested individuals or groups, and the strength of their relationship to the remains in question.

The following guidelines have been developed for the treatment of human remains found in the Sloan Canyon NCA by integrating the principles expressed in the NAGPRA regulations, concerns expressed by Indians, the values expressed in the SAA regulations, and guidelines for protection developed by the Bureau of Land Management.

Human skeletal materials, associated funerary objects, sacred objects, and objects of cultural patrimony must at all times be treated with dignity and respect. Regardless of whether they are left in situ or removed for protection, study, and reburial. Burials, including associated objects, sacred objects, and objects of cultural patrimony found in the Sloan Canyon NCA will be treated with utmost dignity and respect.

Commercial exploitation of human remains is abhorrent. Further, unauthorized removal of any archaeological materials on the Sloan Canyon NCA, including human burials and the matrix in which they are contained is illegal. Unauthorized individuals caught disturbing human burials on the Sloan Canyon NCA will be prosecuted to the fullest extent of the law. Further, any evidence of unauthorized tampering with human burials will be pursued with due diligence to apprehend and prosecute individuals who disturb burials, their associated objects, sacred objects that were placed in the NCA as part of a ceremony or for storage, or any object of cultural patrimony. This includes, but is not restricted to, human burials, rock art, cairns, objects cached in rockshelters, and objects buried in the ground.

All human remains and associated funerary objects, sacred objects, and objects of cultural patrimony found on the Sloan Canyon NCA should receive appropriate scientific study. This stipulation can be accommodated with minimal conflict with tribal concerns if handled in a timely, respectful, and conservative manner. Context description, inventory and metric description, and graphic documentation are the minimal data that must be collected for all human remains, associated objects. More advanced analyses such as radiocarbon dating, DNA and isotopic analyses must be negotiated on a case-by-case basis.

1. DISCOVERY SITUATIONS

In the event that human remains or associated cultural materials are found inadvertently during construction of trails, guzzlers, or other authorized activities, the party responsible for the discovery will cease the activity in the area of the discovery and make a reasonable effort to protect the items discovered. They will immediately notify the Sloan Canyon NCA manager and BLM law enforcement by phone (or in person) and in writing, of the discovery. BLM law enforcement will notify appropriate local law enforcement agencies and coroner to ensure that the discovery is not a crime scene. Upon determination that the site is not a crime scene, the authorized officer will implement the BLM/Nevada

SHPO Statewide Protocol and consider the feasibility of redesigning the activity to avoid the discovered items and preserve them in situ. Whenever possible, human remains exposed on the Sloan Canyon NCA will be carefully and immediately covered in the exact location and with the sediments in which they were found until final disposition is determined.

Human remains or items of cultural patrimony found exposed by erosion, activities of animals such as coyotes or bighorn sheep, or during archaeological research, will be immediately and carefully protected from further exposure by the individual(s) making the discovery. The individual(s) making the discovery will follow the notification process above. After release of the site by the coroner or appropriate law enforcement agency, if erosion or disturbance by animals cannot be curtailed in a reasonable manner, it may be necessary to remove the burial to prevent further exposure, disturbance and destruction.

Human remains that cannot be avoided and left in situ due to other land-use activities, or that cannot be protected from exposure by erosion, activities of animals, or other natural disturbances, must be carefully excavated and kept in as intact condition as possible given their present condition of preservation, until they are either reburied or curated.

2. AUTHORIZED ARCHAEOLOGICAL EXCAVATIONS

All archaeological excavations will include a treatment plan for human remains and associated materials specifically designed for the project as part of the Archaeological Resources Protection Act (ARPA) permit application. Interested tribes will be offered the opportunity to review and comment on the plan as part of the ARPA permit process.

3. DISPOSITION OF NAGPRA MATERIALS

If human remains are recovered rather than preserved in situ, efforts will be made to determine the tribal affiliation of the interred individual and the remains and associated objects will be given to the living descendants after appropriate, scientific documentation of the burial and its associated objects. All discoveries of NAGPRA materials will be subject to the current affiliation/repatriation process at the time of discovery. The validity given any claim by an individual or group regarding any particular human remains will depend on the strength of their demonstrated biological or cultural affinity with the remains in question. If the remains can be identified as those of a known individual with biological descendants, the living descendants will be responsible for appropriate permanent disposition of the remains. They may choose to rebury, cremate, curate, or otherwise dispose of the remains. However, if human remains are recovered from the Sloan Canyon NCA and repatriated to living descendants or an affiliated tribe, reburial cannot occur within the boundaries of the Sloan NCA. Vandalism and looting threaten the archaeological record, including burial sites, which necessitates cooperation between archaeologists, descendants, land managers, and others that may have an interest in the past (stewards, etc.). The Bureau of Land Management cannot legally provide protection for any interment outside authorized curation facilities; once they have been removed from the ground they no longer qualify as archaeological sites and are not covered under existing federal laws and regulations.

Once removed from their original burial place, human remains that cannot be clearly associated with a particular tribe and appropriately reburied according to tribal custom will not be reburied in a generic

manner. Unaffiliated human remains will be curated in an appropriate and respectful manner by the Nevada State Museum, Carson City, Nevada. Such materials will be made available for observation and study only to qualified individuals who will continue to maintain a dignified and respectful treatment of the remains. Curated human remains will be accessible only for legitimate scientific or educational purposes; they will not be put on public display.

PART III: A MONITORING PROGRAM FOR SHORT– AND LONG–TERM EFFECTS BY OTHER USES WITHIN THE SLOAN CANYON NCA

1. IMPLEMENT A SITE MONITORING/STEWARDSHIP PROGRAM

Southern Nevada's rock art and archaeology are at acute risk from the rapid urban growth of Las Vegas and increased leisure use of its hinterland. Damage is frequently manifested in the form of vandalism (defacement and graffiti), theft of portable rock art boulders (Holmes et al. 2002:9), and unauthorized excavation. Sloan Canyon NCA contains numerous rock art sites and other archaeological sites that are at risk from unsupervised public visitation. Rock art sites are particularly fragile cultural resources at risk from both environmental and human causes of deterioration, while buried archaeological deposits are at risk from unauthorized excavation or destruction caused by trampling. The monitoring program outlined below is applicable to all archaeological features present in the Sloan Canyon NCA; measures that are specialized to particular site types are indicated.

Site monitors inspect sites for changes in physical condition and identify whether observed changes are the result of natural factors or human intervention. Natural sources of deterioration include;

- Erosion caused by wind, rain, water runoff etc.
- Aabrasion from plants
- Deposition of minerals over rock art panels (the inclusions in these mineral skins can potentially be dated by direct dating methods)
- Exfoliation of rock surfaces from freeze/thaw cycles, water and salt action
- Surface retreat that is in the nature of the rock
- Animal activity (animals walking over rock art may scratch it with their hooves or claws; burrowing rodents may expose buried archaeological deposits etc.) (Loendorf et al. 1998:73-74)

Anthropogenic causes of site deterioration are both unintentional and deliberate. Unintentional impacts that are the result of site overuse, unsupervised visitation or lack of visitor knowledge can include;

- Abrasive dust thrown up by visitors (Gale and Jacobs 1987)
- Erosion caused by visitors repeatedly following the same trails
- Over-visitation resulting in changes to the natural environment of a site (Brunet and Vidal 1989)
- Repeated touching of rock art with hands, resulting in staining, soiling, and wear
- Walking over rock art panels or archaeological deposits
- Air pollution
- ATV users driving over archaeological sites and rock art (Holmes et al. 2002:9)

- Deposition of trash
- Introducing foreign materials in rock art (chalk, charcoal etc.) to enhance photography
- Making rubbings or latex molds of rock art panels (Loendorf et al. 1998:74)
- Rock climbing over rock art panels (Holmes et al. 2002:9)

Deliberate acts of site deterioration can include;

- Graffiti (either directly over, in association or near rock art) that visually mars a site
- Defacement of rock art (deliberate attempts to obliterate it)
- Use of rock art as target practice
- Theft of portable rock art boulders (and also attempts to remove larger boulders by using a rock saw to cut out the motif)
- Unauthorized excavation (Loendorf et al. 1998:74)

Site monitoring or stewardship programs are potentially an effective form of proactive site management that can manage these environmental and anthropogenic threats to site integrity. Because monitoring programs rely on public volunteers, agencies are faced with the problem of administering volunteers and avocational groups for whom few sanctions exist to correct inappropriate behaviors. Volunteers work on their own schedule and do as much or as little as they wish. Site monitors should be regularly monitored by agency staff as stewardship programs provide the perfect cover for looters and a place for looters to obtain information about sites not publicly known. It is for this reason that monitors should never discuss the site(s) they monitor (even to other monitors) and should never give directions to sites.

Effective site monitoring programs require frequent site inspections that are visible to site visitors, staffed by well-trained and enthusiastic volunteers, and adequately supervised by agency staff to make best use of the monitoring information that is thus derived.

Training—Site monitors should be trained in appropriate procedures and relevant background knowledge. They should learn about existing legal protection for archaeological sites (ARPA etc.) and the requirements for successful prosecution of violations. This will help them understand the reasons for what they are doing and the duties expected of them. Site monitors should be instructed in the methods required for carefully reporting changes in the condition of the site(s) they monitor. Monitors should be able to recognize new impacts (environmental or human) at sites (based on a preexisting thorough record of the site), record new impacts using photography and a sketch drawing. Site monitors need to have impressed on them that in no circumstances should they ever attempt to mitigate any vandalism they may observe. Monitors are trained in safety issues—they should never inspect sites on their own and never approach individuals they observe committing a crime at a site. Instead, they should record the actions observed and report them immediately to agency staff.

Monitoring practices—In general it is not desirable for a steward to monitor more than one site, unless they are in such close proximity that it makes sense to do so. Site monitors are expected to inspect their site once every three months—sites at high risk or which are highly visible should be monitored more frequently, particularly at weekends and other periods of peak activity. This can be achieved by either increasing the frequency of inspections individual monitors make, or by recruiting more site monitors for a particular site. Monitors inspect their site for any sign of human visitation (vandalism, graffiti, looters' pits, trash etc.) or natural erosion, and use a preexisting record of the site's condition on which to base their assessments. If they find evidence of visitation they should proceed cautiously—if the site was

visited in the pursuit of an illegal activity then the site steward's presence and actions can potentially contaminate a crime scene.

Changes to the physical condition of the site are carefully recorded by photography (including a photo-board that records site number, date time, etc.), sketch drawings and a detailed written description. A generalized site impact form could be devised to serve this purpose and distributed to monitors. If the change in site condition is the result of illegal activity monitors should not touch anything and retrace their steps before calling law enforcement or agency staff who will record the condition impact in detail. This is why stewards should always carefully inspect a site for signs of disturbance before clearing up modern trash. Any vandalism or graffiti should be carefully recorded in photographs, sketch drawings and sketch maps, and should only be mitigated by a trained conservator under the direction of agency staff.

Monitors are supervised by a site stewardship coordinator (also a volunteer) who is responsible for either a single site or a small area containing many sites. The coordinator provides monitors with the equipment necessary for them to carry out their tasks—a camera (disposable is acceptable), a photo-board, measuring tapes, drawing materials, notebooks and any necessary agency forms). These materials can be stored in a box that is taken into the field by monitors and returned to the coordinator at the end of the site inspection. Monitors must check-out and check-in with the coordinator before making their inspection and upon their return. The coordinator schedules the inspection rotation, assigns sites to monitors, collects receipts for reimbursement from monitors, and reports directly to the agency staff overseeing site monitoring.

In addition, the BLM will consider the feasibility of remote site monitoring through the use of concealed video cameras. This should be considered for areas of highest archaeological sensitivity and where landscape context contributes an air of seclusion that often makes perpetrators feel that they can be undetected.

All Sloan Canyon NCA site stewards will work under the direction of the NCA archeologist, and under a formal BLM volunteer agreement which sets standards, rules, and requirements.

Administration and training providers—The Nevada Archaeological Association (NAA) is the umbrella organization for archaeology site stewardship programs throughout Nevada. It provides training to volunteer monitors and membership of the NAA is not a condition of participation in its scheme. The NRAF provides training and site monitoring schemes that concentrate on the protection of rock art sites. Its monitoring program is open only to its members—volunteers have to join the NRAF before they can receive training or participate in a stewardship program. Both the NAA and NRAF liaise with the Clark County Heritage Resources Coordinator (a Southern Nevada Public Land Management Act [1998] funded position) who is responsible for overseeing site stewardship programs in Clark County.

2. CONSERVATION GUIDELINES

It is suggested that conservation of rock art sites should involve consultation with a professional rock art conservator. The very specialized knowledge and experience of rock art conservators allows them to: a) understand the structures and properties of a work; b) apply scientific knowledge to the conservation treatment; and c) perform procedures that minimize the loss of cultural material (Odegaard 1999). Conservation procedures adopted are carefully tailored to the needs of individual sites—one solution does not fit all sites or even all panels at the same site (Dandridge and Kane 1999:29). A suggested

conservation and mitigating process (once a conservator's services have been obtained) that could be followed is;

- Carry out a condition assessment of the site
- Conservator advises on the possible risks of proposed treatment measures
- Consult with Native Americans regarding their concerns about the proposed treatment
- Document the area to be cleaned before treatment
- Fully document the treatment used
- Always use the least aggressive treatment first before other options are explored
- Fully document the condition of the area after the treatment is finished (this allows comparison of the finished condition of the area with its condition prior to treatment)
- Monitor the condition of the area on a regular basis after treatment is completed (this allows problems caused by treatment to be identified quickly and before they cause further damage. If mitigating graffiti or other vandalism it is important to monitor the site regularly in case vandals try to restore their vandalism) (Loendorf et al. 1998:75)

Graffiti is usually removed or mitigated because it is seen as encouraging future acts of vandalism by "communicating that such acts are condoned" (Griswold 1999:42; Howard and Silver 1999:36). The pressure on conservators to remove graffiti is strong because the longer an applied material remains on the surface and exposed to the elements, the harder it is to remove (Dean 1999:22). However, the consequences of well-intentioned but un-informed efforts to remove graffiti are potentially as damaging as the original vandalism it is intended to mitigate (Dean 1999:23).

Visual reintegration of graffiti should only be attempted by a trained professional under the direction of agency staff. Additive (e.g., spray paint) and subtractive (e.g., scratching) graffiti pose different problems of mitigation and require different solutions (Griswold 1999:41). Scratched graffiti can be treated by reducing the contrast between the light colored graffiti and the surrounding surfaces. However, it is virtually impossible to completely eliminate scratched or incised letters or shapes by in-painting them as "they will always be picked out by the careful eye on close inspection, no matter how well the paint matches the original surface" (Griswold 1999:45). Some conservators believe that camouflaging or reversing graffiti by in-painting should only be used as a last resort because at best it only minimizes the appearance of graffiti and at worst gives graffiti "a venerable looking patina of "age"" (Griswold 1999:45).

It is suggested that removing or mitigating graffiti or other defacement that directly covers rock art should only be attempted by a professional conservator under the direction of BLM agency staff (Loendorf et al. 1998:76).

3. PUBLIC EDUCATION

Native American interpretation of cultural and natural resources should be included in public interpretation programs and media, in addition to archaeological interpretation of Sloan Canyon's archaeological features. A Native American perspective could include interpretations of the rock art, archaeology, plant resources and other features of interest at Sloan Canyon NCA. Native American interest in such a program was expressed during the ethnographic assessment (Bengston 2004). Continuing consultation with Native American tribes would be one way of achieving this indigenous participation in interpretive programs and the BLM has already hired an American Indian Coordinator/Lead Environmental Education Specialist to assist in this effort.

Public education could be attempted to preempt deliberate or unintentional damage to cultural properties. The most commonly applied public education tool is the strategic placement of signs. Signage is not endorsed at remote or inconspicuous sites as their reduced visibility offers them a measure of protection that would be reduced by the erection of signage (Jameson and Kodack 1991:238). Erecting signs will highlight fragile cultural resources and increase their visibility to potential vandals and/thieves. While signage is not reported to usually result in an increase in on-site vandalism, the sign itself often becomes the focus of vandalism (Jameson and Kodack 1991:240). Signage should be monitored regularly and replaced for damage as necessary.

Signage can be erected in the Sloan Canyon NCA to correct inappropriate visitor behaviors and would not conflict with its status as an NCA or Wilderness Area. Sloan Canyon NCA is already well-known and the levels of site visitation are expected to increase—signs, if erected, would not be making more visible a currently inconspicuous cultural resource. It is a routine BLM practice to erect signs that identify federal lands and their accompanying archaeological sites as a law enforcement measure (Jameson and Kodack 1991:241-242). The absence of signage can make ARPA violations difficult to prosecute—also, protection statues U.S.C. 641 (theft of government property) and 18 U.S.C. 1361 (destruction of government property) are easier to enforce when a site is signed (Jameson and Kodack 1991:243).

Messages on signs are most effective when they describe the importance of the cultural resource, why it is fragile and irreplaceable, provide information of legal penalties, and end with an upbeat message (Jameson and Kodack 1991:243).

Visitor centers can serve as the locus for public education and need to be placed effectively so that they promote and interpret sites which are protected from visitors, and through which they must pass before experiencing the cultural resources. A visitor center could be used to monitor visitor numbers by housing a register. Interpretive kiosks could be placed at each entrance to the NCA. These should advise visitors on correct site etiquette, describe the laws and enforcement measures that protect the cultural resources they will encounter, and outline their cultural value to Native Americans and archaeological interpretation. They could also contain a visitor register.

Site tours are a common educational technique that can successfully manage public curiosity about archaeological sites in a manner where their behavior can be closely monitored. It is also a way of distracting public attention away from vulnerable sites or those that have little or no monitoring in place to protect them. Public tours need to be carefully managed because they can result in overcrowding at sites, leading to increased erosion of trails and abrasive dust being blown onto the rock art panels (Gale and Jacobs 1987:231-232). The size and frequency of public tours, if implemented, should be monitored for their impact on trails and archaeological sites, and modified accordingly if related increased erosion and/or deliberate damage are observed.

Protective measures that obstruct photography should be avoided where possible to remove a possible cause of public dissatisfaction that could lead to them being ignored or challenged by certain users " who will take the opportunity to vandalize or destroy features meant to protect a site" (White 2002:34). Educational devices such as signage and trail guides should be first tried to keep visitors to the trail. If monitoring of land-use reveals that this is ineffective then low barriers could be erected to control visitor circulation patterns.

4. IMPLEMENT A FULL ARCHAEOLOGICAL DOCUMENTATION OF THE ROCK ART SITES

Thorough documentation provides the basis for all conservation and protection measures and is considered an important state goal in the Nevada Historic Preservation Plan (Baldrica 1995). Duke et al. (2004:148) recommend that a detailed documentation of the rock art panels should be done as time and monies allow. This would provide baseline data for management decisions, monitoring programs and enhance the prospects of successful prosecution of ARPA violations. The rock art sites at Sloan Canyon NCA are already suffering the negative consequences of site visitation in the form of graffiti and attempted theft (Duke et al. 2004:51, 145).

White (2002) outlines a three-tiered approach to rock art documentation, where each level is increasingly more intensive and detailed than the last. A Class I documentation consists of completing an IMACS form for each identified site. The most basic components of the site are defined (e.g., features, cultural materials and rock art panels) and a precise UTM and township and range location are taken. A site plan showing the location of major features or concentrations is made. Class II documentation includes the completion of IMACS forms as well as the supplemental IMACS form for each identified rock art panel. Photographs, either 35mm or digital, are taken and site maps showing the location of individual panels are made. Field sketches of each panel should also be completed during this phase. Class III documentation consists of the preceding methods in addition to measured scale drawings of each rock art panel and a precise site plan of the position of rock art panels and their relationship to each other (White 2002:24). White also recommends that a thorough site characterization be completed for each site that includes minimally the following elements;

- Site description including landscape context
- Description of the rock art (type, themes, suggested age and style and production techniques)
- Assessment of the site's condition (including signs of vandalism, unauthorized excavation, presence of trash, natural causes of erosion etc.)
- Determine immediate and potential threats to site integrity
- Provide management recommendations for the protection, education, interpretation and appropriate uses of the site (White 2002:24-25).

The current level of documentation for the rock art at Sloan Canyon is at the level of a Class II survey because scaled field drawings have not been completed for all panels. These are a valuable management tool, particularly when dealing with hard-to-see panels, and they clearly indicate and interpret present and potential threats to image integrity (e.g., spalling, water runoff etc.). For a photographic record to meet existing Nevada SHPO archival standards minimally a black and white negative is required of each panel. In addition, all photographs should include a photo-board recording important contextual information (see

Photo-documentation section below) so they can be used to manage ARPA violations. Photography made during the random and non-random surveys is at a Class I or II level because of the absence of a photo-board and/or color calibration scale and North arrow. It may not be desirable to consolidate the data from previous surveys when making scale drawings to achieve a Class III survey of the rock art sites in the Sloan Canyon NCA. It is frequently difficult and time-consuming to re-identify panels in the field from photographs and some new photography is necessary to bring the photo-documentation to a Class III standard. Consolidation of existing survey data requires harmonization of panel numbering systems (and panels that are renumbered would need to be re-photographed with their new panel numbers). A Class III survey could also take into account the research themes identified in this Appendix and the techniques and data required to address them.

Recording guidelines are outlined in some detail as few published rock art recording protocols exist—most documentation manuals take the form of "gray" literature and are hard to acquire. It is also useful if volunteers are to be used to explain to them some of the rationale underlying non-intrusive methods and why accuracy is important.

Recording Methods—Because some rock art recording techniques currently practiced by rock art researchers are intrusive and/or inaccurate, a suggested recording procedure that is in accordance with the International Federation of Rock Art Organizations (IFRAO) standards is outlined below. Most argument regards the best method for making scale field drawings for which there are three main approaches, summarized below. These are assessed in the light of the IFRAO guidelines for accurate, non-destructive recording techniques (Bednarik 2001). Recording work should be directed by an archaeologist holding a BLM or Nevada State Antiquities permit.

Scale drawings. (a) Drawing from color slides—slides taken in the field are projected onto a wall to be copied onto paper or plastic sheeting. This technique is technically not a field drawing as it essentially is only the tracing of a photograph. Drawings made in this manner are then checked and corrected in the field. This technique is non-intrusive but is inaccurate and time-intensive because re-identifying panels in the field from drawings based on photographs can be a lengthy process, particularly as the scale drawings are drawn to variable scales (the scale is dependent on the position of the photographer when the picture was taken and the size at which the slide was projected onto a wall for the drawing to be made). If the image being recorded is not situated on a flat surface (very common) then the drawing will introduce inevitable distortions caused by tracing an image on an irregular surface from a flat photograph (this is also a problem for direct tracing). Also, when a site contains panels with similar motifs the chances of correcting a drawing against the wrong panel are quite high. All drawing techniques are interpretive and it is therefore always preferable to make scale drawings from the original in the field and not from a secondary medium such as a photograph. The inaccuracy and time-consuming nature of this recording technique make it inappropriate and not recommended.

(b) Direct tracing (as opposed to raised tracing where there is no direct contact between plastic and rock art) is still widely used in some parts of the world, and is used by some recorders in the US (e.g., Lever 2004; Loendorf et al. 1998). This technique involves placing a sheet of Mylar, acetate or other sheet of clear film, over the rock art to be recorded and directly tracing onto the plastic the shape of the motif underneath. It is potentially very time-consuming and results in a 1:1 scale drawing (both significant drawbacks) (Loendorf et al. 1998:61, 63). As this technique involves placing pressure on rock art imagery it is intrusive and potentially damaging, as well as inaccurate (Bednarik 2000; Kolber 2004:2; O'Connor 1999). Rock art researchers advise against any kind of contact with rock art panels ('look, don't touch') as oils from hands touching rock art can be drawn into the rock and contaminate any future dating techniques. Therefore, direct tracing's intrusive nature and inaccuracy recommend against its use in any circumstances. Indirect tracing (i.e., using a frame to support the plastic sheeting) is non-intrusive

but shares the same inaccuracies as direct tracing; it is also very time-consuming and therefore not recommended because a faster and more accurate technique is available (see below).

(c) The least intrusive and most accurate technique for making scale drawings currently practiced involves the use of string grids (Kolber 2004; Loendorf et al. 1998; NRAF 2003). Drawings are made in the field and can be corrected at the same time. A string grid (usually 1 x 1 m in size comprising 10 x 10 cm squares) is laid over the panel to be drawn. This means that the scale used (1:10) is consistent for each drawing—an important consideration for land managers when using drawings to subsequently re-identify panels in the field. The recorder strives to objectively copy on paper only what can be seen on the rock art panel. Any vandalism, graffiti, the removal of (or any attempt at removing) a motif are also recorded, as well as signs of exfoliation etc (NRAF 2003). Drawings include a North arrow, record the rock type, a Munsell color chart reading, the dimensions of the panel and any other applicable comments. If it is not possible to place a string grid over the panel to be drawn (for e.g., the panel may not be accessible) the absence of a scale should be clearly noted on the drawing. No artistic ability is required to make a scale drawing—it is the misperception that artistic ability is necessary that has probably been responsible for the popularity of tracing methods (either from a photograph or directly from the image). This technique is the recommended method for making scale drawings at Sloan Canyon.

Photo-documentation. Photographic techniques should be non-intrusive and non-destructive. Adding foreign materials (e.g., charcoal, chalk, paint etc.) to enhance the visibility of petroglyphs for photography was once a common practice—such practices are now recognized as destructive but some continue to be used. Loendorf et al. (1998:4) report that chalking, at least until 1988, was an approved documentation technique in Colorado and was stipulated on the state's Historic Preservation Office's rock art recording supplemental form. As accurate, non-intrusive photographic techniques exist there is no need for such destructive practices to be employed. However, land managers need to be aware of their existence as some rock art researchers do use destructive techniques despite the damage they cause.

All photographs should contain a photo-board in the picture (otherwise their value is the same as a tourist photograph) (Loendorf et al. 1998; NRAF 2003). Photo-boards provide contextual information that is essential for providing documentation of a site's condition necessary to enable prosecution of ARPA violations and monitor the effects of natural erosion. Information on the photo-board must include: Site Number & Name (if any); Panel Number; Date; North Arrow and IFRAO Color Calibration Scale. Although "white boards and erasable markers" seem convenient, with time and in the hot sun it becomes more and more difficult to erase the marker fully. The black menu board with push-style white plastic letters (more commonly used as open/closed signs for shops) is a good medium for photo boards and is the most clearly visible in photographs (NRAF 2003).

Photographs should be taken of each individual panel and overall panel photographs to show the relationships of panels to each other (Loendorf et al. 1998:38). A photographic log should be kept and should record information such as roll number, exposure number, panel number, etc. The photographic record should minimally include black & white prints (proof sheets are generally made) of every panel—black & white print negatives remain the archival standard of both the Library of Congress and the Department of the Interior (Historic Register) due to their longevity (NRAF 2003). Color slides, color prints and color digital photographs should also be taken—these will be of most use to land managers. Cameras used should always be 35mm SLR and the digital camera should be SLR of least 5 Megapixel resolution. Kodak TMX 100 is an acceptable choice of black and white film. Color slides are of unproven archival quality—Kodak Kodachrome slide film is of good archival quality but Ektachrome can also be used (Loendorf et al. 1998:44). Color prints have a shorter archival life than color slide film and because of the expense of developing they can probably be omitted in favor of digital prints. Digital photographs should be taken in archival TIFF or RAW format—it should be borne in mind that if digital photography is proved in the future to be of greater archival quality than black and white photography, it

may become the new archival standard. Also, as digital technologies and techniques improve, slides may become less important, but currently they cannot be replaced (NRAF 2003).

Mapping. All panel locations and associated archaeological features should be plotted using a hand-held GPS device capable of sub-meter accuracy. (Graffiti and defacement should also be plotted to allow the identification of any new graffiti or vandalism). This will provide both UTM coordinates and allow internal site mapping (i.e., showing the relationships of panel locations to each other) (NRAF 2003). This is another valuable tool facilitating re-identification of panels in the field, and provides information necessary to prosecute theft.

5. EVALUATION CRITERIA

After identification and documentation rock art sites must be evaluated for significance. Not all sites or rock art panels are significant and criteria of evaluation of the heritage value of rock art panels/sites will allow the identification of those panels of sufficient significance to receive more protective measures than those of lesser significance. This also provides a management tool for estimating the scale of damage caused by any future vandalism or natural erosion. Rock art is usually nominated as eligible for inclusion on the NRHP under criteria C and D (White 2002:29). Duke et al. (2004:140) note that rock art is commonly highly esteemed by Native American groups and could be additionally considered Traditional Cultural Properties in accordance with Bulletin 38 guidelines (White [2002] makes a similar point). White (2002:26-27) lists a number of the properties of rock art sites/panels that should be taken into consideration when assessing their eligibility for inclusion to the NRHP;

1) Aesthetic value—topographic setting and landscape setting may have played an important role in past selection of sites for making rock art (White 2002:26).

2) Historic value—rock art sites may record important events or the actions of important people. They may also contribute to a people's continuing sense of place and history (Stoffle et al. 2000; White 2002:26).

3) Scientific value—rock art sites/panel may have scientific value because of their potential to address research themes regarding chronology (because of the potential for direct dating or relative dating studies), past social practices, past ethnic and cultural identities, and past population movements (White 2002:26-27).

4) Sociocultural value—rock art sites/panels potentially have social and cultural value to Native Americans because they are perceived as inherently sacred or have a continuing religious use for traditional ceremonial practices. This sacred quality should be recognized and respected by all users of rock art sites. Also, rock art sites/panels may be of importance because of their role in manifesting indigenous cultural history in the landscape and their educational role in teaching Native Americans about their cultural heritage (White 2002:27-28). In these cases rock art could be treated as traditional cultural properties (Duke et al. 2004; White 2002:28).

In addition to these general principles of evaluation the following more specific criteria should be applied to rock art sites and individual panels to assess their significance and the level of protective measures applied. Table 3 allows the varying significance of sites and individual panels to be assessed based on a quantitative and qualitative consideration of their content and current condition. Sites or panels that have already suffered degradation have reduced significance. A site or panel's evaluation is not permanent—

significance may be restored through conservation work and it may be lost or diminished by future degradation (natural or human-caused). It is suggested that management of Sloan Canyon NCA's rock art sites should attempt to protect a representative sample of its character and features, and protect sites and/or panels that express motif types or styles that are regionally rare and/or not well-represented in the NCA, and/or are unique to the NCA. The development of a motif typology (suggested above) would facilitate the evaluation process.

A consideration of site visibility may assist in prioritizing the intensity of monitoring and/or the nature of protective measures to be applied to sites evaluated as significant. A site or panel's proximity to well-used trails, or a prominent position in the local topography, makes it highly visible to visitors. The nature of certain sites makes them highly visible even if they do not occupy striking landscape positions, in particular sites with large numbers of motifs present. A site's landscape visibility can be heightened by the actions of the general public, in particular the posting to the internet of maps of sensitive archaeological areas.

Table 3. Typology of the Significance of Rock Art Sites and Panels.

Class	Size[a] Motif#	Panel#	Condition[b]	Characteristics	Significance[c]
Ia	1	1	Very Poor to Good	Single prehistoric panel or motif in a well-defined and/or well-known regional or local style. The style and motif type is well represented at other sites in Sloan Canyon NCA	1
Ib	1	1	Normal to Good	A complex single prehistoric panel or motif that covers at least 5 m sq in area and/or comprises over 20 elements;‡ its scale and complexity make it potentially significant even if it is in a well-defined and/or well-known regional or local style. Not well represented at other sites in Sloan Canyon NCA.	3
Ic	1	1	Very Poor to Subnormal		2
Id	1	1	Very Poor to Good	A complex single prehistoric panel or motif that covers at least 5 m sq in area and/or comprises over 20 elements;‡ its scale and complexity make it potentially significant even if it is in a well-defined and/or well-known regional or local style—well represented at other sites in Sloan Canyon NCA	2
IIa	2-10	2-6	Very Poor to Good	Prehistoric panels or motifs in well-defined and well-understood regional and/or local styles which are well represented at other sites in Sloan Canyon NCA	2
IIb	2-10	2-6	Very Poor to Subnormal	Includes some prehistoric motifs that are of a distinctive and/or unusual localized style and/or are not well represented at other sites in Sloan Canyon NCA	2
IIc	2-10	2-6	Normal to Good		3
IIIa	11-50	≥7	Normal to Good	Prehistoric motifs that are representative are of well-defined and well-understood regional and/or local styles that are well represented in the Sloan Canyon NCA. The larger size of the assemblage makes it unusual for the local region	3
IIIb	11-50	≥7	Very Poor to Subnormal		2
IIIc	11-50	≥7	Subnormal to Good	Includes some prehistoric motifs that are either of a distinctive and unusual localized style, or are not well represented at other sites in Sloan Canyon NCA. The larger size of the assemblage makes it unusual for the local region	5
IIId	11-50	≥7	Very Poor and Poor		2
IVa	≥51	≥7	Subnormal to Good	Prehistoric motifs that are representative of well-defined and/or well-understood regional and/or local styles; are well represented in Sloan Canyon NCA. The larger size of the assemblage makes it unusual for the local region. May include some prehistoric motifs that are either of a distinctive and/or unusual style localized to Sloan Canyon NCA, or are not well represented at other sites in the NCA	4
IVb	≥51	≥7	Very Poor to Poor		2

Class	Size[a] Motif#	Panel#	Condition[b]	Characteristics	Significance[c]
Va	≥2	≥2	Subnormal to Good	Site is dominated by prehistoric motifs that are in a restricted regional and/or localized style—may be unique to, or poorly represented, in Sloan Canyon NCA.	5
Vb	≥2	≥2	Very Poor to Poor		2
VIa	≥1	≥1	Subnormal to Good	Motifs/panels that portray historic themes or subjects and can be identified accordingly. Historic subjects are a rare motif in Nevada's rock art	4
VIb	≥1	≥1	Very Poor and Poor		2

[‡]Elements are defined as the constituent parts of a motif/design—it does not refer to the number of motifs

[a]Site size is determined by whichever is greater: the number of motifs present or the number of panels. Duke et al (2004: Table 41) report that the average number of motifs per site surveyed is 41.3 and the average number of panels per site is 7.3.

[b]Condition—**Very Poor**—Motifs or panels are superimposed by very prominent graffiti/defacement and/or more than 40% of the surface of the motif/panel has eroded away; **Poor**—Some graffiti/defacement superimposes motifs/panels and/or some erosion affecting 20-40% of the motif or panel; **Sub-Normal**—Graffiti/defacement is present but not superimposing motifs/panels—it is intrusive and pollutes the visual appearance of the site; **Normal**—no graffiti or defacement present—some signs of natural erosion (exfoliation or other) on motifs/panels but not posing an immediate threat to site integrity; **Fine**—No graffiti/defacement present—few signs of natural erosion; **Good**—No graffiti/defacement and no signs of natural erosion.

[c]Significance is an assessment of site condition and site characteristics—sites rated 1-2 are of no or low significance; 3 = normal significance; and 4-5 = sites of particular significance. Significance does not reflect a site or panel's NRHP status.

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APPENDIX D

Visual Resource Management

VISUAL RESOURCE MANAGEMENT

The visual resource management (VRM) process is divided into two stages: inventory and analysis. Inventory is associated with resource management planning, and analysis is used primarily to determine whether proposed actions are appropriate to a VRM class assigned through the Resource Management Plan (RMP).

VISUAL RESOURCE INVENTORY

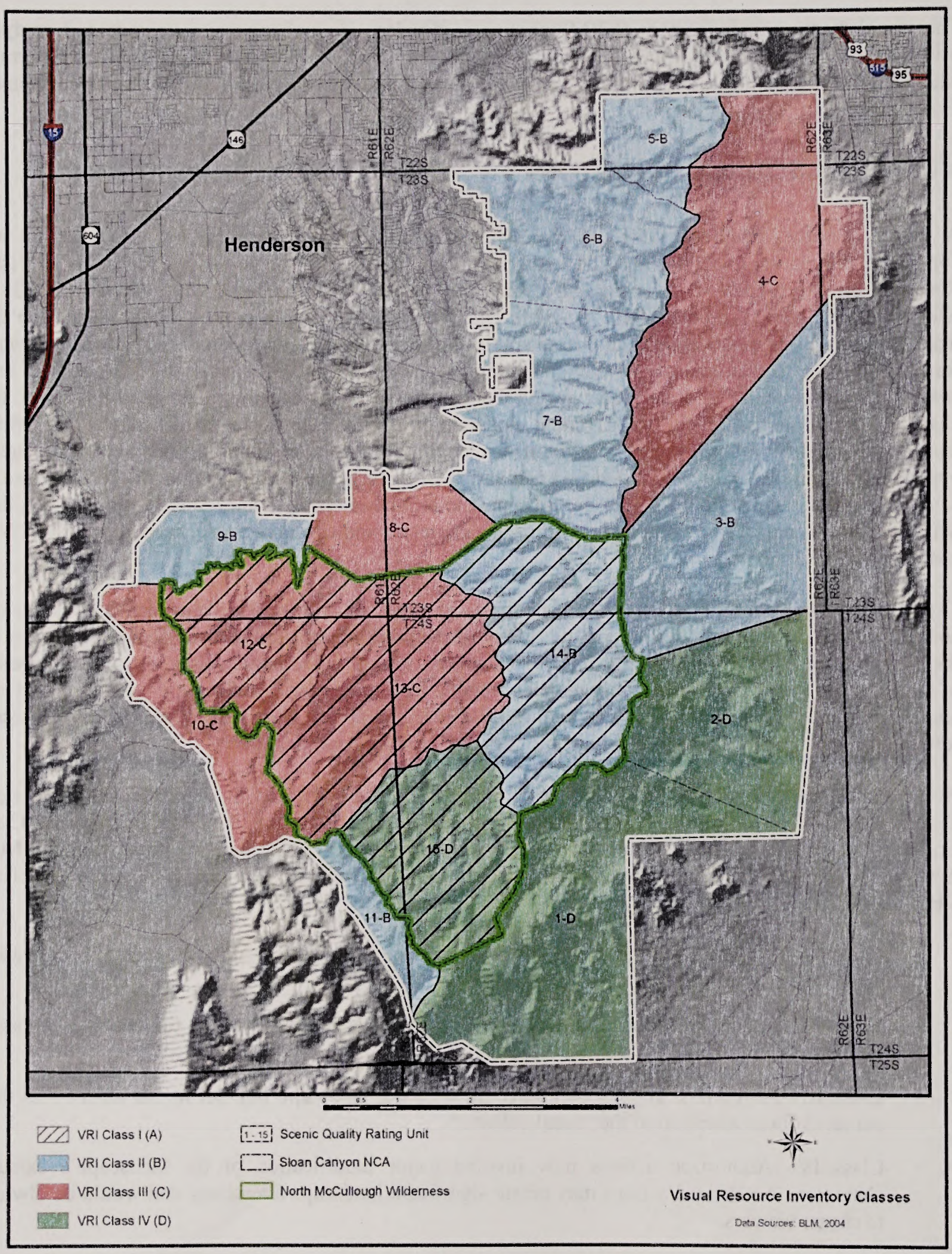
A visual resource inventory (VRI) of the Sloan Canyon National Conservation Area (NCA) was conducted during winter 2003, and the resulting inventory classes are shown in Figure D.1, Visual Resource Inventory Classes. The map also shows the Scenic Quality Rating Units (1 through 15) on which the VRI classes were based. A Scenic Quality Rating Unit is a portion of the landscape that displays primarily homogenous visual characteristics of the basic landscape features (e.g., land and water forms, vegetation, and structures). Inventory findings indicate that large portions of the NCA contain little change to the existing landscape and would be conducive to management designed to retain that character. Some portions of the NCA contain moderate or extensive landscape modifications that detract from scenic quality. Such conditions make it challenging to conserve scenic resources. In these areas, opportunities may exist for restoration and mitigation of disturbances. Other areas of the NCA are so seldom seen that their visual resources do not appear to require intensive management. Nevertheless, they may be easily managed to retain existing landscape character and conserve scenic resources despite VRI ratings of Class III or IV.

The inventory confirmed that the NCA contains large areas of undisturbed desert landscape that can continue to be conserved for scenic quality. Many of the areas inventoried provide scenic backdrops for the urban interface, and other portions of the NCA contain remote wilderness landscapes. A small portion of the NCA has lower visual appeal but remains suitable for a wider variety of multiple uses and provides ample opportunity for restoration of disturbance. The NCA contains a wide variety of high-quality visual resources that can be managed to maintain and improve existing conditions.

At the time of the inventory, VRM classes for the NCA were defined in the *Proposed Las Vegas Resource Management Plan and Final Environmental Impact Statement* and modified by the Clark County Conservation of Public Land and Natural Resources Act of 2002, Title VI (Sloan Canyon NCA Act), which changed the VRM classification of the North McCullough Wilderness. Definitions of the VRM classes are as follows:

- Class I—Authorized actions may not modify existing landscape or attract the attention of casual viewers.
- Class II—Authorized actions may not modify existing landscape or attract the attention of casual viewers.
- Class III—Authorized actions may alter the existing landscape but not to the extent that they attract or focus attention of the casual viewer.
- Class IV—Authorized actions may involve major modification of the landscape's existing character. Authorized actions may create significant landscape alterations and would be obvious to casual viewers.

Figure D.1. Visual Resource Inventory Classes



Methods

BLM directives identify a standard set of procedures for VRI (*BLM Manual Handbook 8410-1*). This Handbook describes procedures for a typical BLM field office, but does not contain specific guidance for smaller areas such as the NCA, which is only 48,438 acres in size. Methods for the VRI of the NCA were developed based on standard inventory procedures, and modified to adapt to the smaller size of the area. The process involved several steps, including the selection of observation points, delineation of Scenic Quality Rating Units, delineation of Sensitivity Level Rating Units, and determination of distance zones. The NCA was evaluated for scenic quality, sensitivity, and distance zones during fieldwork conducted in January 2004.

The purpose of conducting the VRI was to place all portions of the NCA into one of the four inventory classes described above. These inventory classes represent the relative values of the visual resources and provide the basis for considering visual values in the resource management planning process. Results of the VRI describe actual conditions of the resource during the time of inventory and are presented as "inventoried" rather than as "recommended" VRM classes.

Inventory Preparation

The first step in conducting the VRI was the selection of observation points. Two site visits were conducted to determine points to be used in conducting the inventory. 1:24,000 scale U.S. Geological Survey topographic maps were also used to determine desirable points for the VRI. Factors considered in the selection of points included topographic features, visibility of the NCA, amount of use, proximity to travel corridors, proximity to the urban interface, known points of interest, and relative sensitivity.

Observation points selected through field visits and map work were compiled into a digital shapefile for use in a geographic information system (GIS). This shapefile was used in conjunction with a digital elevation model of the area to conduct multiple viewshed analyses. The viewshed analyses showed what portions of the NCA were visible from each observation point, as well as the total area visible from all points. These viewshed analyses facilitated the elimination of points with poor visibility of the NCA and the addition of observation points where needed.

The viewshed analyses also assisted in the creation of Scenic Quality Rating Units and Sensitivity Level Rating Units. Combinations of viewsheds were analyzed to determine which areas of the NCA shared common visibility characteristics and could be combined into units. Based on this analysis, Scenic Quality Rating Units were delineated and digitized. This analysis also determined that Sensitivity Level Rating Units would be the same shape and size as the Scenic Quality Rating Units.

Following this preliminary analysis, a work plan for conducting the VRI fieldwork was prepared using the observation points, Scenic Quality Rating Units, and knowledge of the area. Groups of observation points were associated with each Scenic Quality Rating Unit, and a travel plan was arranged to visit each point. The work plan identified steps for collecting observations, taking digital and 35mm photographs, and evaluating the visual resource characteristics. Throughout the preparation process, the BLM Visual Resource Specialist was consulted to solicit preferences in methodology and present plans and interim products. The work plan, including the observation points, Scenic Quality Rating Units, and viewshed analyses were presented to the BLM Visual Resource Specialist prior to the fieldwork. All products and plans received approval on January 8, 2004.

Field Inventory

Fieldwork for the VRI was completed January 13–16, 2004. The inventory was conducted using the established observation points, rating units, and work plan. Observation points were visited through a combination of vehicle and foot travel. At each observation point, a standard set of observations was taken, including—

- One global positioning point.
- Observations of each Scenic Quality Rating Unit noted on the BLM Scenic Quality form.
- Observations of each Scenic Quality Rating Unit noted on the BLM Sensitivity form.
- Determination of distance zones noted on a Distance Zone form.
- 35 mm photographs of visible areas of the NCA.
- Digital photographs of the same visible areas of the NCA.

In instances where a Scenic Quality Rating Unit/Sensitivity Level Rating Unit was visible from more than one observation point, observations were recorded at the initial point and expanded at subsequent observation points. Similarly, observations of distance zones were recorded for each rating unit at the initial point then expanded as necessary at subsequent points. Digital and 35 mm photographs were taken at each observation point to capture representative scenery visible from each point. In several instances a series of photographs was taken to capture a panoramic view of the NCA.

Post-Inventory

Following the field inventory of visual resources in the NCA, results of the evaluation were organized and compiled to combine the scenic quality, sensitivity, and distance zone ratings into VRI classifications. The following tasks were conducted:

- Forms used in evaluation of the three visual resource components were completed, and final classifications for each were tabulated.
- Global positioning system points captured for each point were converted into shapefiles.
- Digital and 35 mm photographs were sorted and organized against the photo log.
- Ratings produced for scenic quality, sensitivity, and distance zone were combined and produced as digital GIS layers using the "scores" reported on the rating forms.

Results

Once the inventory ratings were completed, the three components were combined using methodology based on the approach described in *Visual Resource Management Manual Handbook 8410-1,* Illustration 11. This approach was modified using *BLM Technical Note 407—Integrating GIS Technologies with the Visual Resource Management Process* (*November 2001*). The GIS methodology in *Technical Note 407* describes the procedure for combining rating components into inventory classes. The procedure of Method 2, described on pages 9 and 10 of *Technical Note 407*, was used to create VRI classes in a GIS. The Boolean Rules in Method 2 were applied to the three rating layers for Scenic Quality, Sensitivity, and Distance Zones to produce the VRI layer.

VISUAL RESOURCE ANALYSIS

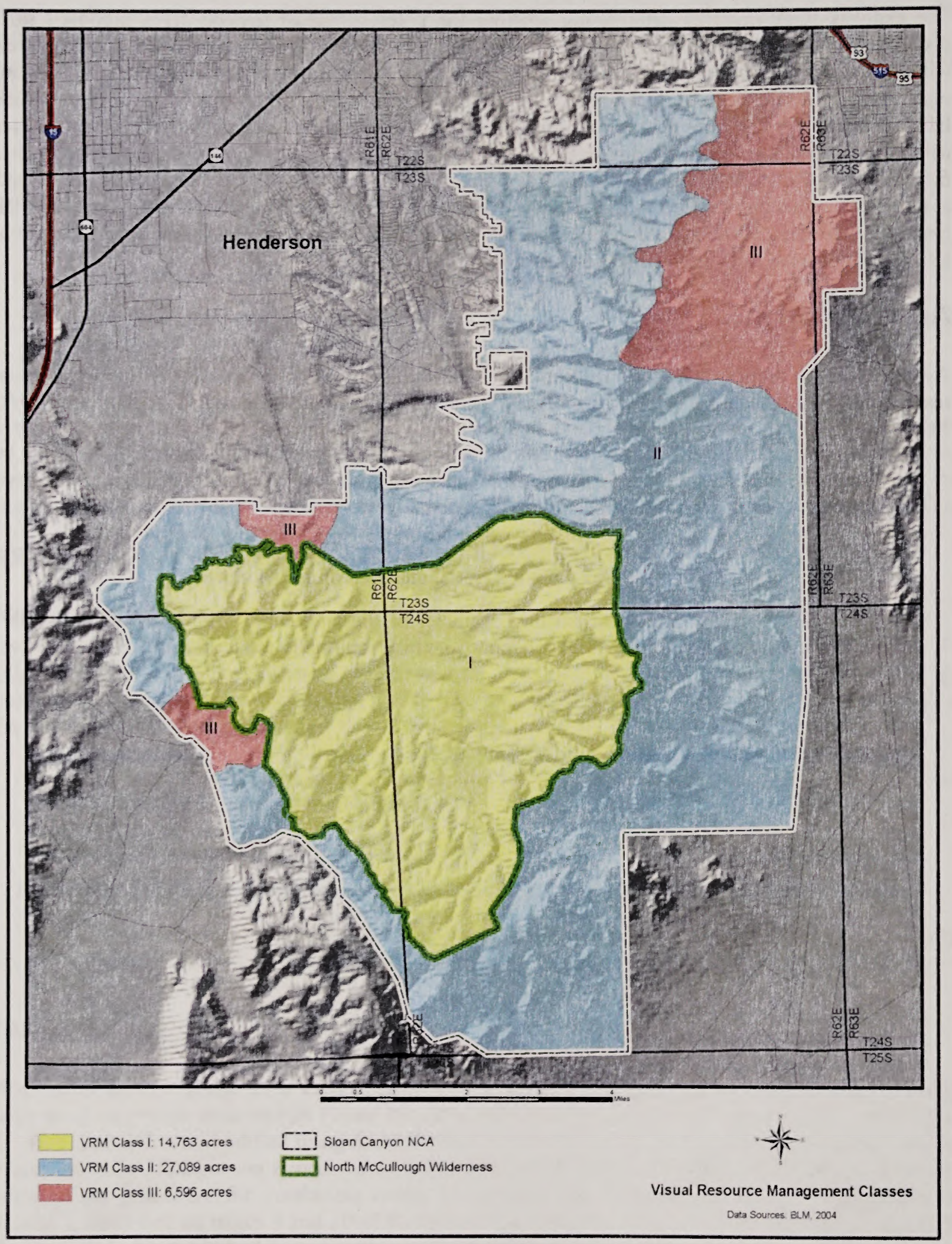
The analysis stage involves determining whether the potential visual impacts from proposed surface disturbing activities or developments would meet the management objectives established for the area or whether design adjustments would be required. Visual Contrast Ratings are determined at the start of planning, prior to the beginning of construction or disturbance. During the visual contrast rating process, BLM compares the features of the proposed project with the major features in the existing landscape using the basic design elements of form, line, color, and texture. The complete process is described in *BLM Handbook H-8431-1, Visual Resource Contrast Rating*. The results of the analysis are then used as a guide for reducing visual impacts. Once every attempt is made to reduce visual impacts, BLM managers can decide whether to accept or deny project proposals. Managers also have the option of attaching additional mitigation stipulations to bring the proposal into compliance.

Approved Plan

As discussed in section 2.3.6 of the Proposed RMP and shown in Figure D.2, the NCA's visual resources are assigned to the following management classes, as defined in *BLM Handbook H-8410-1, Visual Resource Inventory*:

- Class I—Preserve the existing character of the landscape. Authorized actions may not modify the existing landscape or attract the attention of casual viewers.
- Class II—Retain the existing character of the landscape. The level of change to the characteristic landscape should be low and may not attract the attention of casual viewers.
- Class III—Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate and may minimally attract the attention of the casual viewer.

Figure D.2. Visual Resource Management Classes—Approved Plan



APPENDIX E

Interpretive Strategy and Environmental Education Strategy

SLOAN CANYON NCA INTERPRETIVE STRATEGY AND ENVIRONMENTAL EDUCATION STRATEGY

The cities of Las Vegas and Henderson, Nevada, form one of the fastest growing metropolitan areas in the United States. A rapidly expanding, urban and suburban metropolitan area of homes, businesses, and infrastructure now surrounds the well-known lights of The Strip. Yet immediately on the edges of this expansion, much of the land is open and undeveloped. This constantly changing interface of urban and natural settings provides unique challenges and opportunities for the Bureau of Land Management (BLM), Las Vegas Field Office, which manages public lands comprising much of this open space. In November 2002, Congress designated the Sloan Canyon National Conservation Area (NCA), located adjacent to the City of Henderson, to preserve and protect a portion of southern Nevada's Mojave Desert as a permanent asset for future generations.

Residential housing, schools, parks, and businesses will eventually border much of the northern and western edges of the NCA; however, at present, the NCA is undeveloped, and most recreation use occurs near the Sloan Canyon Petroglyph Site. There is no visitor facility, there are multiple entrances with few roads, and most visitors do not come into contact with BLM staff. However, the future urban and diverse audience will need to understand the NCA's valuable natural and cultural resources to appreciate and protect them. Finding ways to achieve this understanding will be the challenge of the NCA Interpretive and Environmental Education Program.

This strategy clarifies and sets direction for the Interpretive and Educational Program at the Sloan Canyon NCA. It provides a vision for future interpretation, education, and visitor experience opportunities. The strategy guides the development of an effective interpretive program that would serve visitors; promote the health of the land; and enhance the public's enjoyment, understanding, and appreciation of the NCA. This document presents a brief overview of the interpretive planning process, a discussion of the purpose and significance of the NCA, existing visitor conditions in the NCA, and high-level actions related to the NCA's interpretive and educational goal and objectives. Whenever possible, the Interpretive and Environmental Education Programs should be in the same organizational group.

1.0 THE INTERPRETIVE PLANNING PROCESS

The ultimate goal of the interpretive planning process is to establish a cost-effective, focused, high-quality program that effectively addresses all audiences and that identifies a variety of visitor experience opportunities. Building on the high-level management actions prescribed in the Sloan Canyon NCA Approved Resource Management Plan (RMP), this strategy provides a framework within which a more detailed comprehensive interpretive plan would be prepared. It provides tactical guidance for subsequent planning and leads to implementing actions directed toward interpretation and visitor experience opportunities.

This strategy would help focus collaborative planning discussions with internal interpretive team members (e.g., subject matter experts) and external cooperators. External cooperators could include surrounding communities, interested tribes, and other federal agencies. Subsequent planning could include the development of appropriate interpretive services, facilities, programs, and media that protect and preserve resources while communicating the NCA's purpose, significance, compelling stories, themes, and values.

In addition to a tiered planning approach, the Interpretive and Environmental Education Program would integrate and support the ongoing planning efforts of other resource teams. For instance, there is a

common interest in managing the North McCullough Wilderness for key visitor experiences; therefore, wilderness and recreation planning should strongly tie with the Interpretive and Environmental Education Program.

2.0 PURPOSE OF THE SLOAN CANYON NCA

The Clark County Conservation of Public Land and Natural Resources Act of 2002 (the Clark County Act) established the Sloan Canyon NCA and the North McCullough Wilderness, which is entirely contained within the NCA. The approximately 48,438-acre NCA forms the natural, mountainous southern skyline of the cities of Henderson and Las Vegas and contains unique scenic and geologic features and important archaeological sites (see Figure E.1). The centerpiece of the NCA is the Sloan Canyon Petroglyph Site, one of the most significant cultural resources in southern Nevada. More than 300 rock art panels with nearly 1,700 designs represent native cultures dating from the Archaic to historic era.

> The purpose of the Sloan Canyon NCA, per the Clark County Act of 2002, is—
>
> "…to conserve, protect, and enhance for the benefit and enjoyment of present and future generations the cultural, archaeological, natural, wilderness, scientific, geological, historical, biological, wildlife, educational, and scenic resources of the Conservations Area."

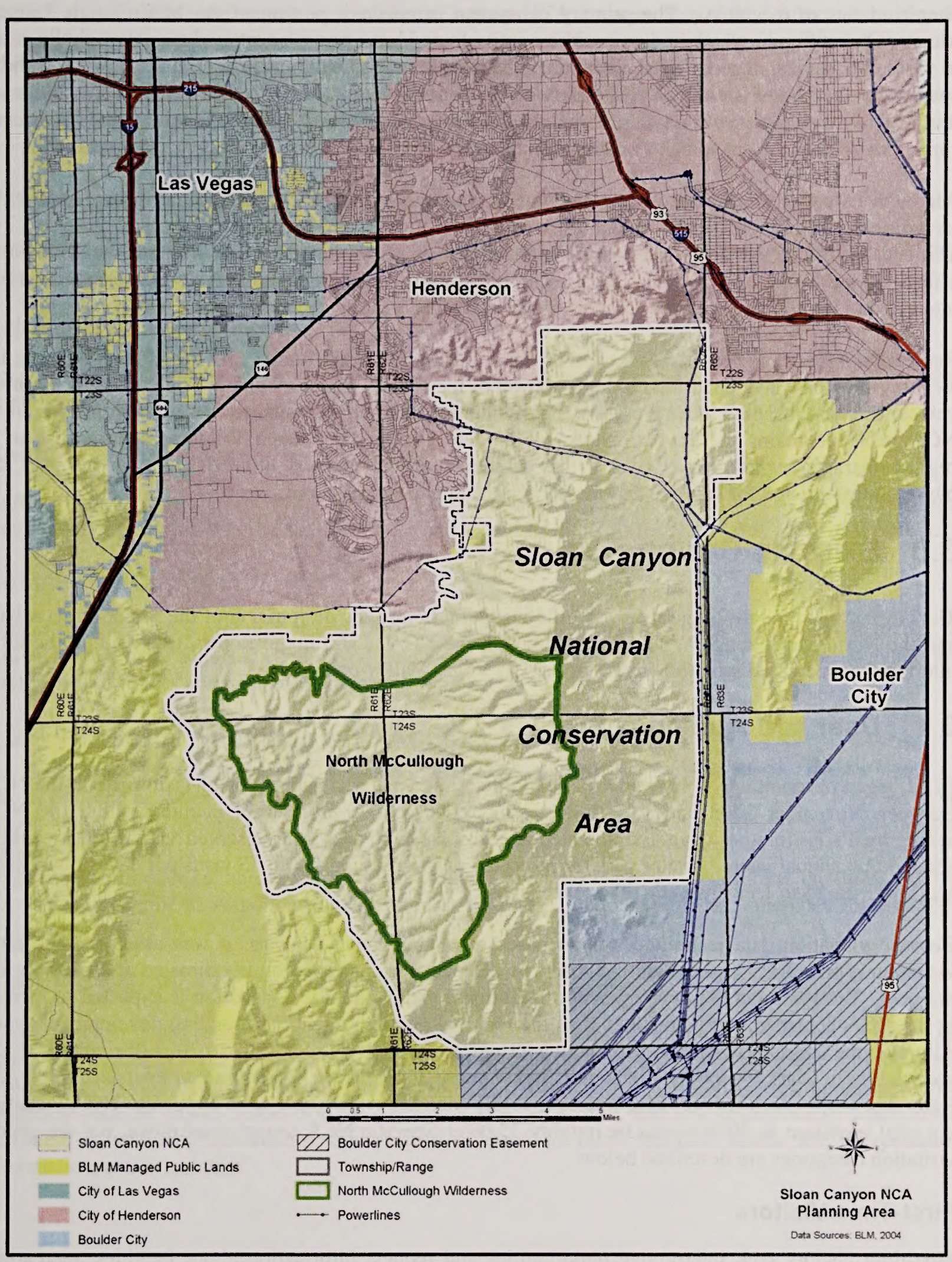
The Clark County Act directs the Secretary of the Interior, through the BLM, to manage the Sloan Canyon NCA in a manner that conserves, protects, and enhances the Conservation Area's resources for the benefit and enjoyment of present and future generations. The Clark County Act identifies cultural, archaeological, natural, wilderness, scientific, geological, historical, biological, wildlife, educational, and scenic resources as important reasons for establishing the NCA. The designation of the North McCullough Wilderness, administered under the Wilderness Act of 1964 and Titles II and VI of the Clark County Act, requires that approximately 14,763 acres within the NCA be preserved and protected in their natural, primitive condition.

2.1 Significant Features of the Sloan Canyon NCA

The Sloan Canyon NCA encompasses the northern portion of the McCullough Range, lies southeast of the City of Las Vegas, and borders the City of Henderson. Volcanoes formed the McCullough Range, and a long basalt spine dominates the topography within the NCA. The eastern slopes of the range are much steeper than the western slopes, and the ridgeline offers excellent views of the Las Vegas Valley, numerous mountains, and the Eldorado and Jean dry lakes. Elevations within the NCA range from about 1,800 feet on the southeastern border to 5,000 feet at Black Mountain.

Archaeological evidence suggests that humans have used the NCA resources for nearly 7,000 years. Sloan Canyon Petroglyph Site, located within the southwestern portion of the NCA, contains more than 1,700 rock art elements within a 0.5-mile stretch of canyon. Although cultural affiliation has not been determined for each panel, archaeologists studying Sloan Canyon believe it has been used by many previous cultures, including Archaic. An ethnographic study completed for the Sloan Canyon NCA RMP and ongoing consultation with tribes have confirmed the cultural significance of the Sloan Canyon Petroglyph Site to today's Native Americans. In addition to the Sloan Canyon Petroglyph Site, cultural resources inventories identified 19 other rock art sites in and around the NCA, but never in the quantities or as elaborate as in the canyon. The Sloan Canyon Petroglyph Site has been listed on the National Register of Historic Places since 1978.

Figure E.1. Sloan Canyon National Conservation Area Planning Area



The McCullough Range is located in the Mojave Desert near the confluence of two other unique geographic zones: Colorado Plateau and Great Basin. This setting plays a major role in the natural characteristics of the NCA. The primary ecosystem in northern portion of the McCullough Range is Mojave Desert Scrub, which is dominated by creosote and bursage with scattered stands of cholla cactus in varying densities, depending on elevation. The Blue Diamond cholla, considered a potential candidate species by the U.S. Fish and Wildlife Service, is also found within the NCA. Small communities of unique and isolated vegetation types, including several Special Status Species of beardtongue (*Penstemon spp.)*, exist within the canyon and wash microclimates.

Although essentially only one ecosystem type is represented, the NCA supports a variety of wildlife, including desert bighorn sheep, mountain lions, Gila monsters, and the threatened desert tortoise. Two artificial wildlife water locations (guzzlers) were developed within the NCA through the cooperative efforts of the BLM, the Nevada Department of Wildlife (NDOW), and private conservation groups interested in improving habitat for bighorn sheep and other wildlife species.

Recreation is becoming an important use of the North McCullough Range. As urban growth in the Las Vegas Valley has enveloped the northern portion of the NCA, hiking, mountain biking, and off-highway vehicle use have become more prevalent. This situation can be contrasted to the southern portion of the NCA, which contains the approximately 14,763-acre North McCullough Wilderness. Because of its rugged character, which limits access, this southern portion received little visitation in the past, and opportunities abound for solitude and for primitive and unconfined recreation.

3.0 EXISTING CONDITIONS

The North McCullough Range received little visitation before the designation of the Sloan Canyon NCA and the North McCullough Wilderness. Although the NCA is still undeveloped, usage along the urban interface has increased with the growth of the Las Vegas Valley population.

3.1 User and Audience Profiles

BLM began observations in November 2003 to determine patterns and trends of visitor use at the NCA. Between November 2003 and July 2004, about 4,000 total visitors were counted within the NCA, averaging 15 visitors per day. Extrapolated to a full calendar year, the observed visitor total would be about 5,500 annual visits. Visitor patterns indicated peak visitation (15 to 35 visits per day) on weekends and lower use (5 to 15 visits per day) on weekends.

Because visitation data is limited, for purposes of planning and analysis, it was assumed that actual visitation is five times higher than the observed. Hence, current visitation is estimated at 28,500 visitors per year. Even without the development of additional visitor facilities, visitation is expected to increase as the NCA becomes better known and as the regional population and surrounding development grows. Although the City of Henderson had about a 22-percent growth rate for 2000 to 2003, the current annual growth rate in Clark County is 4 percent (Clark County 2003a in the *Sloan Canyon Proposed RMP/FEIS* Reference List). As a conservative estimate, if this constant growth rate were applied to NCA visitation, the total visitation in 2030 would be roughly 75,000. Specific NCA usage is unknown, but the general visitation categories are described below.

First-Time Visitors

First-time visitors seek interpretive opportunities and request information about facilities, recreational opportunities, and cultural and natural resources of the area or region.

Repeating and Recreational Users

Some repeated users may return to the Sloan Canyon NCA because they found information about a specific interpretive program or activity they would like to attend or participate in. Recreational users often travel with people who are already familiar with the area and have no interest in taking time out from their activity to attend "educational/interpretive programs." Their main interest is information regarding conditions related to their chosen recreational activity, which might be posted at the trailheads; therefore, there might not be a need for them to visit the visitor center.

Native American Traditional Users

Native Americans from surrounding tribes that have historically used the area for traditional cultural activities may visit the NCA for cultural purposes.

Scientists and Researchers

Scientists and researchers from universities and government agencies may come to the NCA to conduct scientific research to further support the vision of the BLM and Sloan Canyon NCA management.

Hunters

Hunters permitted by NDOW would be only a very small percentage of the visitors to the NCA. Hunters would visit only during specific seasons of use and would be likely to focus on some areas of the NCA.

Community Outreach

Because of the NCA's proximity to the urban Las Vegas Valley, there is a potentially large audience for outreach programs. This audience includes schools, service clubs, sporting clubs, and special events and could involve concessionaires and tour operators.

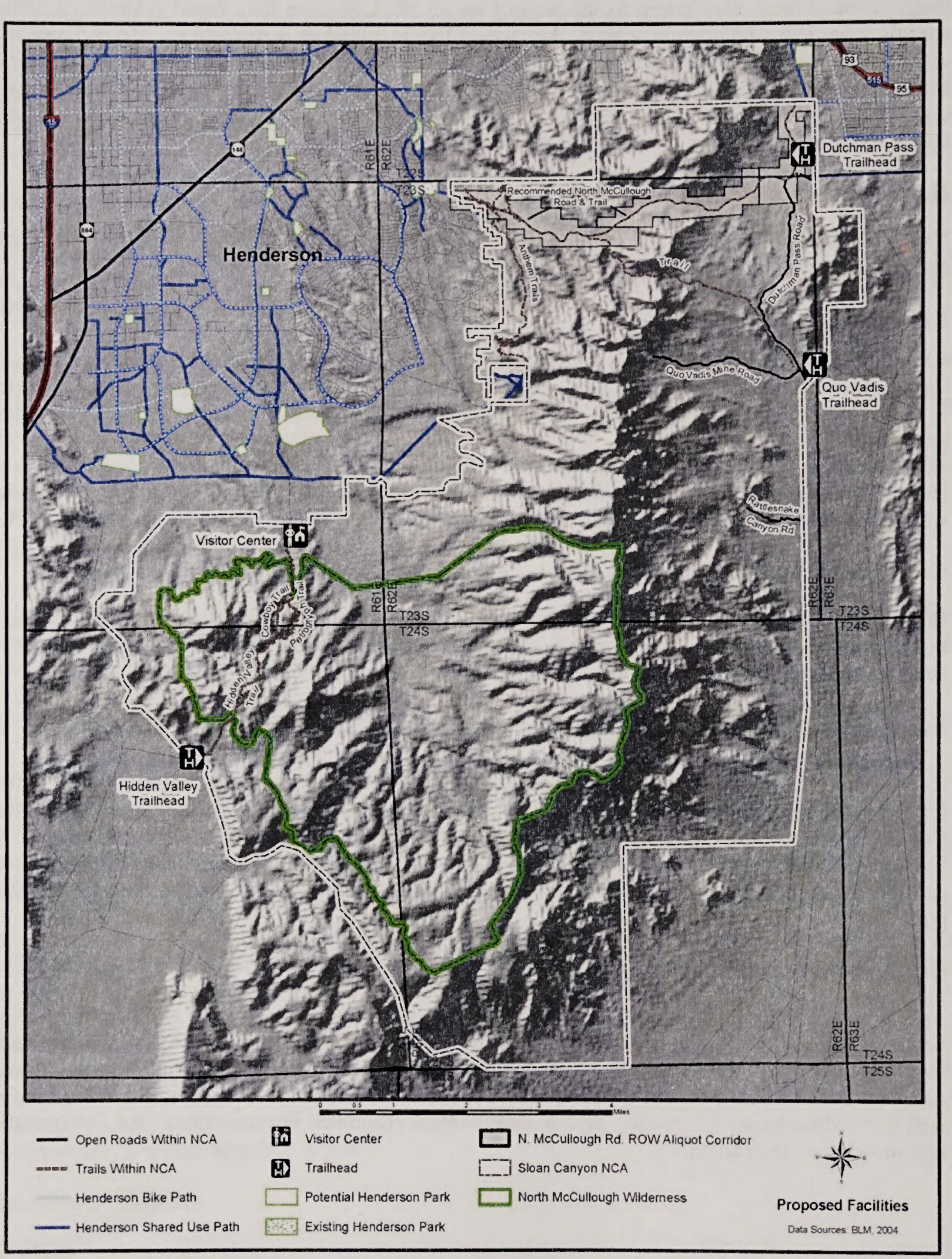
3.2 Potential Facilities and Access

No developed facilities exist within the NCA. However, the Sloan Canyon NCA Approved RMP discusses potential facilities and access points into the NCA, including the northern entrance of Sloan Canyon, Hidden Valley Trailhead, Dutchman Pass Trailhead, and Quo Vadis Trailhead. Figure E.2, Proposed Facilities Map, shows the locations of these potential facilities. Additional facilities could be developed over time as visitation increases and as resource monitoring indicates the need for additional protection.

Northern Entrance of Sloan Canyon

A visitor center could be constructed near the NCA boundary at the north entrance to Sloan Canyon. The visitor center could be used as an access point for the Sloan Canyon Petroglyph Site, provide onsite resource protection and interpretation, and provide NCA management. The visitor center could include amenities such as office spaces for the Sloan Canyon NCA staff and law enforcement; maintenance facilities; educational classrooms; and a public space to meet visitors' needs for interpretation, information, and orientation.

Figure E.2. Proposed Facilities



Hidden Valley Trailhead

A multi-panel kiosk placed inside the NCA boundary would provide safety, orientation, and resource protection information as well as limited highlights of local recreational opportunities and interpretive stories.

Dutchman Pass Trailhead

A freestanding, multi-panel sign would be placed near the proposed North McCullough Road. Messages could include safety, orientation, resource protection information, interpretive stories, and recreational use by equestrians.

Quo Vadis Trailhead

A freestanding, two-panel sign would be located at the trailhead displaying informative messages, orientation, safety, and interpretive stories.

Minor Trailheads

Freestanding, single-panel sign or bulletin board would be placed at minor trailheads to display brief safety information on trail, orientation, and brief interpretive stories.

3.3 Issues and Influences

The following resources and management issues could be addressed through the interpretive media (e.g. brochures, websites).

Safety Issues

- Summer temperatures in southern Nevada regularly exceed 100°F, and many visitors may be unprepared for the severity of such exposure.
- There is little road access into the entire NCA, and most portions require self-sufficiency. Some visitors may be unprepared, ill equipped, or inexperienced in handling wilderness, wildlife, and weather dangers.
- Monsoon-driven heavy thunderstorms, accompanied by lighting and flash flooding, often occur during summer, and some of the most frequently visited areas are wash bottoms. Visitors may be unaware that these floods are extremely dangerous.
- Potable water is not available in the NCA.

Visitor-Related Resource Issues

- "Leave No Trace," "Tread Lightly," and/or other minimum impact resource use might not be practiced by some visitors.
- Some visitors may not know they are in an NCA and/or do not know understand the rules and regulations leading to unintentional infractions or resource violations.
- Cultural resource site protection in backcountry is an issue.

- The limited number of access points might concentrate visitor use, impacting the resource and visitor experience.

Other Management Issues

- A perceived and sometimes real conflict might exist between recreational users.
- Public and visitors do not recognize the significance of Sloan Canyon NCA.

4.0 Interpretive Goal and Associated Objectives and Actions

The Sloan Canyon NCA Approved RMP identifies the following goals, objectives, and actions that provide a framework for more detailed interpretive planning:

Provide opportunities for on- and offsite visitors to develop an appreciation and understanding of the NCA's resources through educational, informational, and inspiring interpretive experiences.

Objective 1

Provide orientations, education, accurate information, regulations, and interpretation that helps meet the user's needs (e.g., tours, kiosks, brochures, virtual tours, website, libraries, community outreach).

Actions

- Provide thematic interpretive presentations to enhance the appreciation, understanding, and protection of the NCA's natural, cultural, and recreation resource values.
- Identify ways of increasing the NCA's interpretive services through cooperative efforts with other government and nongovernment agencies, Native American tribes, cooperating associations, permitted outfitters and guides, concessionaires, and nonprofit organizations.
- Develop criteria and procedures for identifying interpretive needs and evaluating programs and media.
- Identify and maintain accurate databases on interpretive projects and facilities associated with the NCA.
- Prepare an annual implementation plan that would identify the NCA's priorities to be accomplished for the year.
- Identify and compile basic information (safety, orientation, and recreational information) that could be provided to customers through appropriate media (online, visitor access areas, cooperative sites, and programs).

Objective 2

Identify opportunities for Native American tribes to provide programs and products.

Actions

- Partner with interested Native American tribes in developing interpretive programs, educational material, and media on NCA resources that are consistent with the NCA mission, including integrating regional historic and contemporary tribal relationships with the NCA and the expanded story of traditional cultures.

- Develop a repository for storing Native American archival literature, including space where visiting Native Americans can conduct cultural research.

Objective 3

Provide interpretation that fosters stewardship behavior in visitors so their actions would have a minimum impact on the NCA's resources.

Actions

- Use interdisciplinary teams to identify local resource management issues to be addressed by interpretive efforts.

- Select interpretive media and techniques that minimize impact to and enhance the protection of the resources.

Objective 4

Increase public awareness of NCA management goals.

Actions

- Broaden public support for the NCA by providing outreach programs to a diverse audience. Inform the public about the sensitive nature of the NCA resources, purpose of the NCA designation, and need for NCA regulations.

- Consider developing a diverse range of high-quality experiences that is consistent with NCA purposes and is based on NCA's resources and values, with consideration for sustainable practices and traditional uses.

Objective 5

Provide opportunities for research specialist, researchers, and managers to participate in the development of outreach presentations and media.

Actions

- Promote, coordinate, and disseminate research to enhance scientific understanding of the NCA environment and incorporate this research into the Interpretive and Education Program for the public's benefit.

APPENDIX F

Litter Cleanup Plan and Public Lands Awareness Campaign

SLOAN CANYON NCA LITTER CLEANUP PLAN AND PUBLIC LANDS AWARENESS CAMPAIGN

The congressionally designated Sloan Canyon National Conservation Area (NCA) consists of nearly 48,438 acres that encompass a diverse landscape, ranging from the North McCullough Wilderness (Wilderness) to borders with densely populated urban areas. The Sloan Canyon NCA Act (Title VI of the Clark County Conservation of Public Land and Natural Resources Act of 2002), which established the NCA, requires the Bureau of Land Management (BLM) to develop a management plan for the NCA, including a plan for litter cleanup and a public lands awareness campaign in and around the Conservation Area. Incorporating this Litter Cleanup Plan and Public Lands Awareness Campaign into the Approved Resource Management Plan provides adaptability and efficiency in implementing cleanup actions by identifying management priorities and related potential decisions and helps ensure that an effective anti-litter message is delivered.



Northeast portion of the NCA depicting illegal disposal of automobile



Illegal paintball course (Northeast portion of the NCA)

Litter and trash are fundamental problems affecting the NCA, and related concerns were brought forward during the public scoping process. Materials currently found within the NCA range from litter associated with the NCA's proximity to the urban area, to trash including abandoned automobiles, appliances, furniture, and shell casings. In addition, the illegal dumping of construction and landscaping debris is common near the NCA boundary.

Other contributing factors to the litter problem include prior recreational use and the lack of public education and awareness. Furthermore, before the establishment of the NCA, this area was part of the 3 million acres of land under the responsibility of the BLM Las Vegas Field Office, and the enforcement of illegal dumping was difficult. The litter and trash problem is compounded by the area's increased use as a result of the changing population of Clark County, Nevada, which is one of the fastest-growing counties in the nation and includes the areas immediately surrounding the NCA. In addition, awareness of the NCA since its designation is expected to increase visitation to the area and consequently the potential for additional litter. Nonetheless, the increased BLM management presence should help reduce litter and trash dumping.

1.0 LITTER CLEANUP PLAN

To proactively address the litter problem, the BLM Las Vegas Field Office has implemented an interim management plan, which was implemented during the Sloan Canyon RMP planning process. The purpose of this interim management, which is based on existing laws, regulations, and guidance, including the *Proposed Las Vegas Resource Management Plan and Final Environmental Impact Statement* (BLM 1998a in the *Sloan Canyon Proposed RMP/FEIS* Reference List), is to maintain the resources and values that were the basis for creating the NCA while more detailed planning is in progress. Numerous elements comprise the interim management plan for the NCA, but those pertaining to litter focus on cleaning up some of the most damaged areas, establishing the boundaries of the NCA through signing, educating the public on the NCA's existence and applicable regulations, and enforcing current rules. The two basic elements of current litter control, which will be further discussed in this plan, are litter cleanup and prevention via law enforcement and education.

Currently, the Sloan Canyon NCA management is hosting volunteer desert cleanups on a nearly monthly basis, including a major National Public Lands Day event in October 2004. During that event, 250 volunteers picked up more than 35 tons of trash, and the City of Henderson Public Works Department and volunteer off-highway vehicle (OHV) user groups removed more than 20 automobile bodies. During the interim period, signs have been placed along the NCA boundary and at main access points leading to the Wilderness boundary. A program for visitor contact and education by NCA staff and BLM law enforcement was undertaken, with an introductory warning period for OHV use, recreational target shooting, and camping in portions of the NCA subject to BLM and Clark County use closures. This warning period was followed by enforcement actions by BLM and local law enforcement. This Litter Cleanup Plan is intended to build on the progress made during interim management and eventually result in an NCA that is litter-free as possible. Because of the magnitude of the existing litter deposits and the large area affected, a two-pronged approach of cleanup and prevention would be used to reach this goal.

1.1 Litter Zones

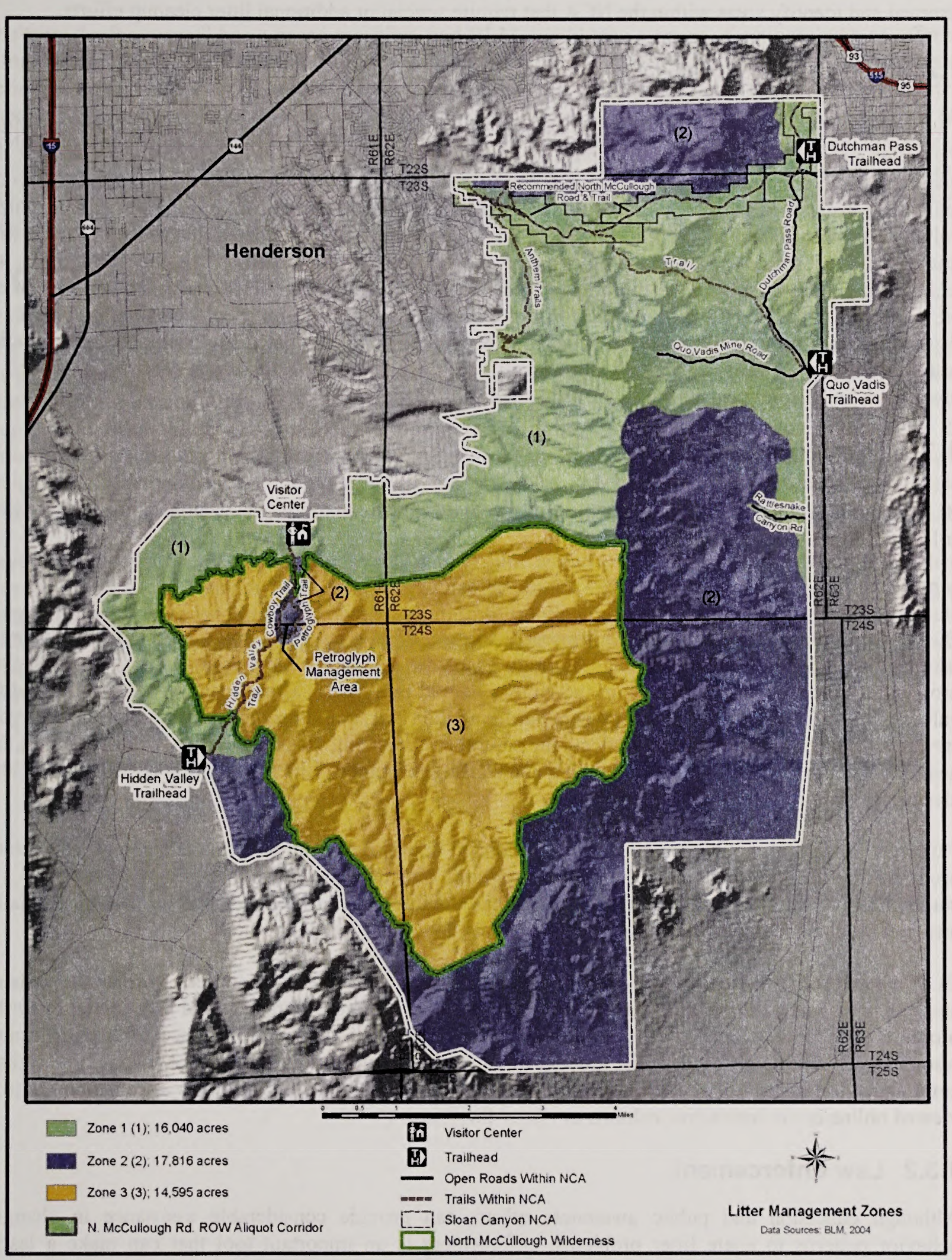
To facilitate implementing the Litter Cleanup Plan, the NCA was divided into three litter zones based on the Management Emphasis Area zones described in the Approved RMP, current litter conditions, accessibility, and proximity to future developed areas (Figure F.1).

Zone 1, High Litter Management Area—Mainly is the northern portion of the NCA near the urban interface that historically contained large amounts of litter and dumping. Although at present some of the area has been cleaned up through volunteer efforts, this zone is easily accessed by illegal dumpers and continues to have a high priority for cleanup and enforcement. These heavily littered areas are considered to have high probability for future litter concerns.

Zone 2, Moderate Litter Management Area—Forms the southeastern and southwestern border of the NCA and the highly visited Sloan Canyon Petroglyph Site. Zone 2, which has medium to low concentrations of litter, would require moderate litter management and enforcement. Once existing litter is removed, it could be kept at a minimum through public awareness and education.

Zone 3, Low Litter Management Area—Consists of the Wilderness, where the amount of litter is very low. Because visitation is also low, this area is anticipated to need minimal litter management and enforcement. However, as this areas is managed to maintain natural and primitive characteristics, litter cleanup would be in important aspect.

Figure F.1. Litter Management Zones



Monitoring would be used to measure the effectiveness of the Litter Cleanup Plan and track changes in litter levels. BLM would conduct visual surveys of the NCA to determine the effectiveness of litter removal and identify areas within the NCA that require special or additional litter cleanup efforts.

1.2 Cleanup Phase

The first step in creating an NCA that is as litter-free as possible is to remove existing trash and litter. Volunteer programs historically have been the primary mechanism for cleaning up the NCA, and this tradition would continue, focusing on Litter Zone 1 first, until the current litter is removed. BLM would maintain partnerships with local communities such as the City of Henderson, businesses, and organized volunteer groups to help ensure a successful removal campaign. It is anticipated that much of the existing litter would be removed before completion of the RMP planning process. In the Wilderness, the techniques employed to remove the litter would be those that cause the least impacts. Portions of the NCA, such as areas that have been used for target shooting, would require special cleanup processes. In these areas, the surface might need to be scraped to remove all accumulated material, and the vegetation restored. Once an area is deemed "litter-free," the level of new litter within the NCA would be monitored, and cleanup events would be scheduled as needed.

1.3 Prevention Phase

BLM would develop anti-litter educational messages aimed at all NCA visitors. In addition, litter enforcement activities would be increased.

1.3.1 Education

During the cleanup phase and into the foreseeable future, BLM would encourage visitors to maintain and take pride in the condition of the NCA through education and by developing an awareness of the litter problem and its associated impacts on the NCA's natural resources. Those visitors who understand the values of the NCA, along with homeowners bordering the NCA, could become strong advocates and good stewards. Litter not only adversely affects the natural environment, visual amenities, wildlife, and human health, but controlling it also affects funding and staffing resources. Litter prevention costs less than litter cleanup.

Particular attention would be given to developing appropriate outreach materials and educational programs, particularly anti-litter educational programs directed to various user groups of the NCA. A comprehensive litter messaging strategy or outreach themes would be developed as part of a detailed interpretive planning and would likely include "Leave No Trace" outdoor ethics.

BLM would seek to exemplify and encourage good stewardship of natural resources by reducing, reusing, and renewing materials where possible. For example, a recycling program would be adopted to further promote litter prevention and to provide educational messages on the importance of reusing limited resources. In addition, to reduce the amount of paper that might become litter, BLM would use website communication instead of printed materials where possible. NCA maps and other information could be viewed online or via interactive exhibits at visitor facilities.

1.3.2 Law Enforcement

Although education and public awareness efforts can provide considerable assistance in changing behavior patterns to abate litter problems, enforcement is an important tool that can make a lasting difference. The purpose of enforcement is to minimize the impact of littering and dumping, promote and

achieve compliance with the law, and enable courts to uphold the law by punishing offenders and deterring others.

The term "enforcement" has a broad meaning, and BLM would take a range of actions, such as offering information, advice, and warnings; penalty notices that could require action within a specified time period; and prosecutions. BLM would work in cooperation with local agencies to promote a consistent approach, including policies and guidelines for the enforcement of dumping and littering regulations (43 Code of Federal Regulations 9640.1 [f] and [k]). Enforcement duties would include tagging and towing abandoned vehicles, issuing warnings, and investigating illegal dumping within the NCA. BLM would explore the possibility of developing a trash reporting hotline and consider the development of NCA-specific special regulations, such as banning spray paint cans from the NCA.

2.0 PUBLIC LANDS AWARENESS CAMPAIGN

The Sloan Canyon NCA Act also requires BLM to develop a plan for a public lands awareness campaign. As part of this plan, BLM would seek to increase cooperation with the other public land agencies (United States Forest Service, National Park Service, United States Fish and Wildlife Service, and the Nevada Department of Wildlife) to develop messaging on a variety of public lands issues, including the enforcement of existing litter laws and regulations. The campaign would include establishing and maintaining relationships with other federal, State, and local governments (City of Henderson, Boulder City, and Clark County) to assist in public lands messaging.

Several existing programs, foundations, and partnerships address littering on federal lands in southern Nevada. The Sloan Canyon NCA would optimize resources and increase efficiency by utilizing and integrating with these established programs to increase public education and awareness and to maintain and improve on current volunteer programs. In addition, public land agencies would develop strong relationships with local media for delivering public lands messages, including anti-littering messages and notifications of upcoming cleanup events.

APPENDIX G

Vegetation Restoration Strategy

VEGETATION RESTORATION STRATEGY

The primary goal of the Vegetation Restoration Strategy is to improve vegetation conditions in the Sloan Canyon National Conservation Area (NCA) through the restoration of existing disturbances and the management and control of future disturbances. The overall objective of the restoration strategy is to improve habitat for sensitive species by restoring ecological processes and functionality. Consideration of recreation management, livestock grazing management, and wildlife habitat management, as well as vegetation and soils management, are necessary components of the restoration strategy.

Specific priorities for restoration, and objectives associated with each restoration priority, are outlined in Table G.1.

Table G.1. Restoration Goals and Objectives

Restoration Goals	Objectives of Restoration
Ecosystem Functionality	Water infiltration Hydrologic function Soil stability (including biological crusts) Vegetation structure and species composition
Habitat Restoration	Reducing fragmentation Increasing connectivity of native plant and animal populations
Route Camouflage	Restore natural vegetation community appearance Reduce inadvertent reuse of routes being restored
Aesthetics	Improve natural appearance of vegetation and meet VRM criteria
Existing Disturbance	Improve natural appearance of vegetation and meet VRM criteria

BACKGROUND

The vegetation resource in the Sloan Canyon NCA is representative of the Mojave Desert ecosystem, corresponding to Bailey's American desert and semi-desert province (Bailey 1995 in the *Sloan Canyon Proposed RMP/FEIS* Reference List). The Vegetation Community Inventory of the Sloan Canyon NCA (BLM 2004 in the *Sloan Canyon Proposed RMP/FEIS* Reference List) categorizes the vegetation resource of the NCA as the Mojave Desert community with the four major vegetation associations. Distribution of these vegetation associations within the NCA is primarily related to geomorphic landform patterns and elevation and is associated with bajadas, slopes, dry washes, and mid-elevation slopes. The four vegetation associations identified within the NCA are described in the following paragraphs.

Volcanic–Basalt Slope Association. This association is primarily located on upper elevations of the NCA associated with the basalt "spine" of the McCullough Range. Isolated patches of this vegetation association also occur in the NCA, primarily on slopes in the southwestern portion. Primary components of the association are volcanic rock, and the primary vegetation components are bursage, ephedra, and creosote. Secondary vegetation components are barrel cactus, perennial grass, and annual and perennial forbs.

Moderate Creosote Association (>%30 cover). This association is dispersed throughout the NCA in relatively level areas with less well-developed desert pavement. The primary vegetation component of the association is creosote. Secondary vegetation components are bursage, annual and perennial forbs, and annual grass.

Sparse Creosote/Bursage Mix Association. This association is the most prevalent vegetation association within the NCA. It is found on lower to mid-elevation slopes and contains level areas with

well-developed desert pavement. The primary vegetation component of the association is creosote. Secondary vegetation components are bursage, annual and perennial forbs, and annual grass.

Desert Wash Association. This association is distributed in the lower elevations and level areas of desert washes. Slopes in this vegetation association are level with well-sorted gravels and sands. Primary vegetation components are creosote, perennial grass, and annual and perennial forbs. Secondary vegetation components are cactus species, ephedra, and bursage.

Because of the extremely dry climate, perennial vegetation establishment is usually limited to years when precipitation occurs in higher than normal amounts. Annual plant species comprise a large ephemeral portion of each plant association. Annual plants grow only during the years when precipitation falls at the correct time and in a greater than normal amounts.

Because of mountainous conditions, limited water resources, and the lack of mineral resources, the Sloan Canyon NCA has experienced little grazing, off-highway vehicle (OHV) use, or mineral activities. Although vegetation associations within the NCA have experience physical and biological disturbance stemming from recreation use and past introductions of non-native plant species, erosion has been relatively low historically and vegetation cover is good. Disturbance to the vegetation resource in the NCA has increased in recent years because impacts from human activities related to urban expansion (e.g., recreational use such as hiking, OHV use, biking, including cross-country experiences) have continued to expand, increasing surface disturbance, vegetation loss, and the disruption of desert pavement. Surface disturbance occurring within the NCA increases the vulnerability of vegetation to invasive species infestation. Once colonized in disturbed areas, invasive species may be capable of out-competing native species, including Special Status Species in undisturbed areas.

PURPOSE AND NEED

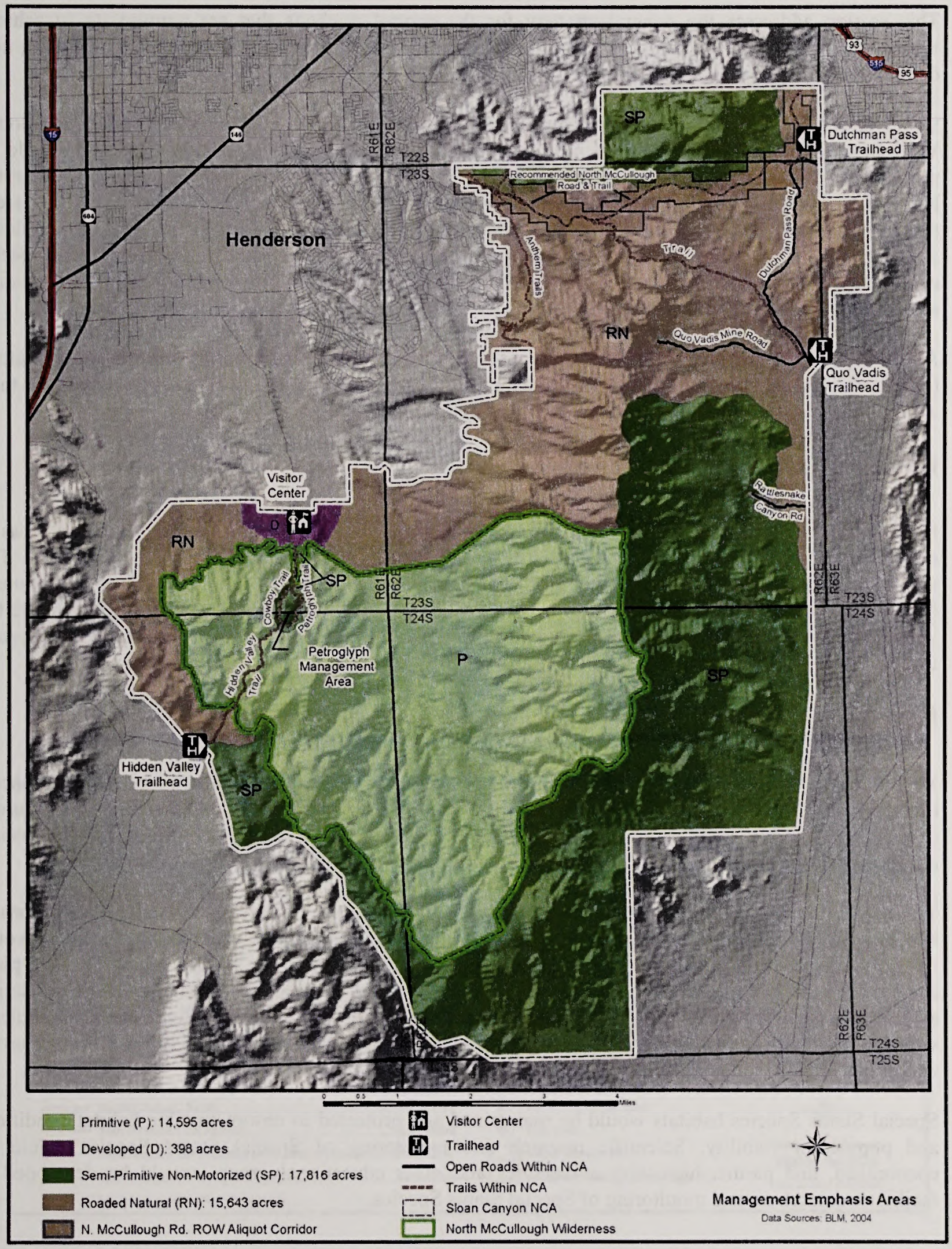
Vegetation in much of the NCA is relatively undisturbed. Restoration of existing disturbance and plans for controlling new disturbance are needed to direct restoration priorities within the Sloan Canyon NCA. By improving habitat for sensitive species and restoring ecological processes and functionality, the restoration strategy may result in the control of soil loss, maintenance of native plant associations, reduced vulnerability of vegetation associations to invasive species infestation, and enhancement of visual resources.

Project Prioritization

This vegetation restoration strategy would be applied to the entire NCA, including the North McCullough Wilderness. BLM would work with various local organizations and agencies to promote education and assist in preventing the establishment of invasive species. Furthermore, scientific research and monitoring of Special Status Species would be encouraged and facilitated through the development of partnerships with universities and other educational groups for research and monitoring of Special Status Species.

Priority for restoration projects would be focused in the Semi-Primitive Non-Motorized, Roaded Natural, and Developed Management Emphasis Areas (MEA) (Figure G.1) to restore or improve conditions in native plant associations. Areas of special concern where restoration projects would be considered include habitat for Special Status Species, areas with a high risk of wildfire (e.g., wildland-urban interface areas), and the North McCullough Wilderness. For example, restoration projects to remedy wilderness intrusions or incursions in sensitive species habitat and areas of entry would take priority.

Figure G.1. Management Emphasis Areas



RESTORATION METHODS

This section addresses the general strategy for the control methods that are appropriate to achieve vegetation restoration objectives. Methods focus on restoring existing disturbance and controlling new disturbances by activities managed by BLM within the NCA.

Under this strategy, future disturbance from activities with the NCA, including the North McCullough Wilderness, should be minor. Any impacts from activities on sensitive vegetation habitat should be minimized. Disturbance from development of visitor facilities or new rights-of-way (ROW) within the NCA should be minimized, and the potential spread of non-native species into such disturbed areas should be reduced. Overall, vegetation management included under this strategy should move vegetation associations toward potential natural conditions by reducing habitat fragmentation, improving species diversity, increasing structural diversity, and maintaining the long-term viability of the vegetation associations.

As strategy and policy are implemented, new methods would be considered and included in the strategy (e.g., biological control for tamarisk and Sahara mustard). BLM would evaluate new methods for their appropriateness and use within the NCA including the North McCullough Wilderness.

Existing Disturbance

BLM would apply the following strategy to maintain or improve the condition of vegetation on areas in the NCA currently affected by surface disturbance from OHV or other uses and development. The strategy emphasizes the improvement of protective ground cover and soil-holding capability in previously disturbed areas, which would reduce soil erosion and loss, reduce habitat fragmentation, and decrease the vulnerability of vegetation associations to invasive species infestation. About 100 miles of disturbance from roads, OHV trails, and foot trails have been identified within the NCA (see Figure G.2).

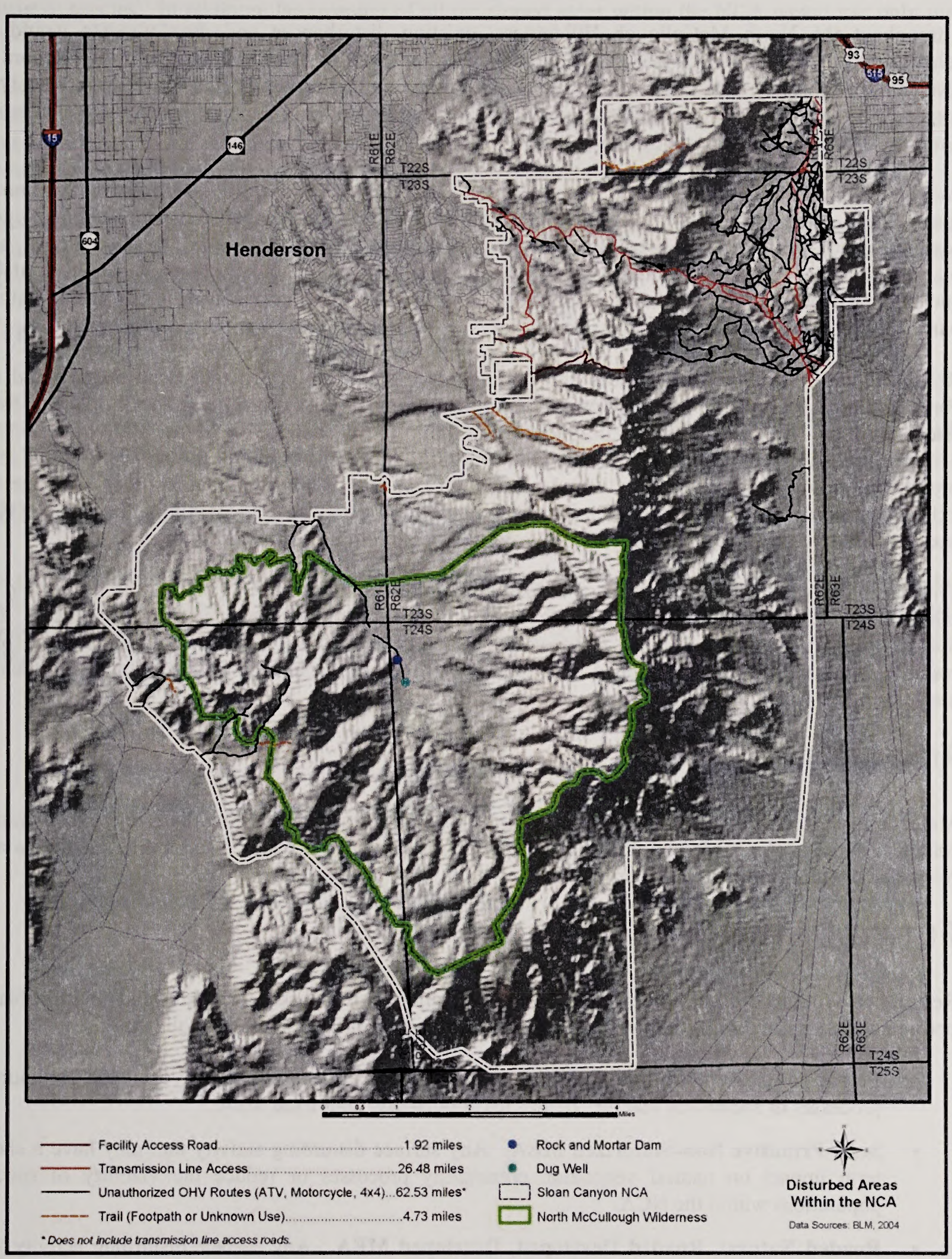
Non-Wilderness

Vegetation would be managed in all MEAs to promote native plant associations and restore species diversity and structure in disturbed areas. Restoration (i.e., rehabilitation, reclamation, and revegetation) of existing disturbances would be managed for optimum species diversity by seeding native species, except where non-native species are appropriate.

Trails established without BLM approval would be evaluated and may be restored to natural conditions or adopted into the trail system. The restoration of nonauthorized trails established within the NCA would not only decrease the likelihood that these disturbed areas would become dominated by invasive plant species but also improve the condition of the vegetative resource by reducing fragmentation of vegetation associations and improving population viability over the long term. Priority for restoration projects would be focused in Semi-Primitive Non-Motorized and Roaded Natural zones to restore or improve conditions in native plant associations.

Special Status Species habitats would be maintained and protected to ensure suitable habitat conditions and population viability. Scientific research and monitoring of Special Status Species would be encouraged, and partnerships with universities and other educational groups would be developed to facilitate research on and monitoring of Special Status Species.

Figure G.2. Disturbed Areas within the NCA



North McCullough Wilderness

Throughout the North McCullough Wilderness, existing disturbances and developments would be rehabilitated within 4 years of the Sloan Canyon NCA Approved Resource Management Plan Record of Decision using appropriate methods determined through a minimum requirement/minimum tool analysis for each project. Active rehabilitation would take place on those areas not currently rehabilitating naturally or located within washes.

Active rehabilitation would include methods/processes designed to remove and obscure the known disturbances. Methods/processes such as breaking up compacted surfaces; recontouring to original grade; seeding and/or planting of vegetation native to, and currently occurring within, the Wilderness; and placement of dead vegetation and rock, collected near the site, to mimic the form and texture of the surrounding landscape. In the interim, all access routes would be blocked using signs and/or natural barricades located outside the wilderness boundary.

Rehabilitation of existing disturbances and developments would be prioritized based on potential for continued use. Priority would be given to the two-track vehicle routes accessing the Wilderness from Hidden Valley, and vehicle routes, despite postings, that could continue to be used for unauthorized access into the Wilderness and are anticipated to be a management issue until such time that signs of their presence is obscured through rehabilitation. Although last priority for attention, in order to utilize the existing access and prevent damage to prior restoration efforts, removal and rehabilitation of the dug well and rock dam would be necessary prior to the rehabilitation of other two-track disturbances.

The visible portions of social trails not desired for future designation, modification, or use would be rehabilitated utilizing the same methods/processes previously identified for existing disturbances. The non-visible portions of these social trails would be left to rehabilitate naturally. Continued use of a restored social trail would be dispelled by dispersing visitation to other locations using methods such as area closures, barriers, and visitor information.

Transportation

Methods for restoring existing disturbance could be applied to restoring existing roads and transportation routes. For example, roads and unauthorized parking areas may be restored to natural conditions and revegetated with native vegetation species.

FUTURE DISTURBANCE

Restoration would be used to remediate future vegetation disturbance. The threshold of disturbance before minimizing impacts to native plant associations for each MEA could be as follows:

- **Primitive MEA.** Any surface disturbing activity that may alter natural vegetation community processes or reduce the viability of species populations within the NCA.
- **Semi-Primitive Non-Motorized MEA.** Any surface disturbing activity that may have a short-term impact on natural vegetation community processes or reduce the viability of species populations within the NCA.
- **Roaded Natural, Roaded Developed, Developed MEA.** Any surface disturbing activity that may have a long-term impact on natural vegetation community processes or have a long-term impact on species populations within the NCA.

Ongoing efforts to map, monitor, and eradicate invasive plant species would be continued. BLM would work with various partners to promote education and assistance in preventing the establishment of invasive species. In addition, landscaping of all developed areas within the NCA would use only plant species native to the NCA.

BLM would maintain and protect sensitive species habitats to ensure suitable habitat conditions and population viability. Scientific research and monitoring of Special Status Species would be encouraged and facilitated through the development of partnerships with universities and other educational groups for research and monitoring of Special Status Species.

Special Status Species critical habitat would be avoidance areas for disturbance or development in order to maintain suitable habitat conditions and population viability. Site-specific surveys for Special Status Species habitat would be required before any development activities.

Transportation

Methods for the management of future disturbance from construction of new ROWs, roads and transportation routes would be similar to those described above. Applications for new ROWs would be considered on a case-by-case basis if evaluation shows that the ROW would benefit the NCA.

NOXIOUS AND INVASIVE WEEDS

Noxious and invasive weeds would be managed under integrated weed management principals, including following BLM's *Partners Against Weeds—An Action Plan for the BLM* (BLM 1996 in the *Sloan Canyon Proposed RMP/FEIS* Reference List) and the general restoration strategy for the BLM Las Vegas Field Office.

LITERATURE CITED

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_. 2004. Vegetation Community Inventory of the Sloan Canyon National Conservation Area. BLM Las Vegas Field Office. December 2004.

APPENDIX H

Biological Management Strategy

BIOLOGICAL MANAGEMENT STRATEGY

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1.0 INTRODUCTION

The study of wildlife species in recent times has become, of necessity, an effort to determine the impacts and results of human environmental development on animal populations. Along these lines, the study of the urban interface with undeveloped lands is becoming more important than ever.

The Sloan Canyon National Conservation Area (NCA) offers a unique opportunity to add data to the study of the effects of housing developments on several wild populations. As the surrounding communities of the City of Henderson and Boulder City continue to grow, several populations with extensive home ranges would experience the loss of some familiar habitats no longer available to them. The Bureau of Land Management (BLM) would research and monitor the health of these populations with the cooperation of universities and federal and State agencies. BLM would work cooperatively with the Nevada Department of Wildlife (NDOW), specifically on providing habitat for maintenance of population objectives and management activities designed to moderate populations (e.g., hunting, trapping, and transfer); and with the U.S. Department of Agriculture Animal and Plant Health Inspection Service/Wildlife Services in the management of wildlife (including Special Status and Sensitive Species, hunting, and trapping), recognizing respective management jurisdictions.

The goal of wildlife management for the Sloan Canyon NCA is to maintain and enhance native wildlife resources and provide for biological diversity of wildlife resources while ensuring healthy ecosystems. The objectives are—

- Manage to protect Special Status Wildlife Species and habitats in the NCA, including federally listed, State-sensitive, and Clark County Multiple Species Habitat Conservation Plan (MSHCP) species, according to existing law, regulation, policy, and/or agreement
- Maintain or enhance habitat quality and quantity to adequately support the life history requirements of a diversity of wildlife species
- Promote healthy and viable wildlife populations through appropriate habitat and species management actions that would lead to providing for ecological integrity within the NCA
- Protect important migratory bird habitat according to existing law, regulation, policy, and/or agreement.

The study of species addressed in this general management strategy may help maintain the ecological integrity and biodiversity of the NCA, may indicate through survey data when habitat is being fragmented, and can be used as a focal point for helping the public learn about and support conservation of natural resources in southern Nevada.

The species to be covered in this management plan would include those listed below. The desert tortoise (*Gopherus agassizii*) would be addressed through formal consultation with the U.S. Fish and Wildlife Service and therefore would not be considered in this management strategy.

Mammals

- Desert bighorn sheep (*Ovis Canadensis nelsoni*)
- Coyote (*Canis latrans)*
- Bobcat (*Felis rufus)*
- Grey fox (*Urocyon cinereoargenteus*)
- Kit fox (*Vulpes macrotis*)
- Cougar (mountain lion) (*Felis concolor*)
- Several species of small mammals (e.g., kangaroo rats [*Dipodomys* sp.]), desert wood rats (*Neotoma lepida*), pocket mice, grasshopper mice, and deer mice)
- Various species of bats (20 species of bats have been recorded in Clark County, Nevada).

The following bats are likely to be found in Sloan NCA:

- California leaf-nosed bat (*Macrotus californicus*)
- California myotis (*Myotis californicus*)
- Fringed myotis (*Myotis thysanodes*)
- Yuma myotis (*Myotis yamanensis*)
- Western pipistrelle (*Pipistrellus hesperus*)
- Big brown bat (*Eptesicus fuscus*)
- Spotted bat (*Euderma maculatum*)
- Pallid bat (*Antrozous pallidus*)
- Brazilian free-tailed bat (*Tadarida brasiliensis*)
- Big free-tailed bat (*Nyctinomops macrotis*).

Reptiles

- Western chuckwalla (*Sauromalus obesus*)
- Side-blotched lizard (*Uta stansburiana*)
- Western Whiptail (*Cnemidolphorus tigris*)
- Zebra-tailed lizard (*Callisaurus draconoides*)
- Desert spiny lizard (*Sceloporus magister*)
- Desert horned lizard (*Phrynosoma platyrhinos*)
- Collared lizard (*Crotaphytus insularis*)
- Desert iguana (*Dipsosaurus dorsalis*)
- Western banded gecko (*Coleonyx variegates*)
- Leopard lizard (*Gambelia wislizenii*)
- Gila monster (*Heloderma suspectum cinctum*)
- Coachwhip snake (*Masticophis flagellum*)
- Gopher snake (*Pituophis melanoleucus*)
- California kingsnake (*Lampropeltis getulus*)

- Mojave desert sidewinder rattlesnake (*Crotalus cerastes*)
- Mojave green rattlesnake (*C. scutulatus*)
- Southwestern speckled rattlesnake (*C. mitchellii pyrrhus*).

Amphibians

Red spotted toads *(Bufo punctatus*)

Birds—Resident Species

- Red-tailed hawk
- Prairie falcon
- Merlin
- Barn owl
- Great horned owl
- Common raven
- Verdin
- Screech owl.

Birds—Migratory Visitors

- Various hummingbirds
- Various warblers
- Swallow
- Oriole
- Eagle
- Peregrine falcon
- Rock Wren
- Burrowing owl
- Turkey Vulture.

2.0 BIOLOGICAL SURVEYS

This Biological Management Strategy for Sloan Canyon NCA identifies methods that may allow the collection of baseline data for addressing population numbers and ongoing efforts for determining long-term population trends.

An example of one important species in the NCA is the western chuckwalla described below. Two survey techniques for this species and their relative merits follow.

2.1 Western Chuckwalla (*Sauromalus obesus*)

The strictly herbivorous reptile diet of this species produces a scat of fibrose texture that is distinct in shape from other herbivorous reptiles. Chuckwalla scat varies in color from green (freshest) to brown to grey (oldest), is fibrose in texture, elongate and narrow in shape, measuring from about 15 mm (.6 in)

long by 3 mm wide (0.1 in) to about 70 mm (2.7 in) long by 10 mm (0.5 in) wide (B. Hardenbrook, pers. comm. 2005). Desert tortoise scat (although similar in appearance to chuckwalla scat) is larger in diameter and oval in shape, and most can be distinguished from chuckwalla scat. Generally, only scat of small tortoises may look exactly like small chuckwalla scat.

Chuckwallas were mostly observed between the hours of 10:30 to 15:30 (small sample size). Scat was observed at altitudes as high as 1,550 m (5,100 feet).

2.2 Survey Methods

One should be aware of climatic conditions: during a dry year, sightings would decrease because of food availability; sightings are expected to increase during a moist cycle.

Spotting Surveys (also known as "Visual Encounter Surveys" by NDOW; this method is not very effective). Spotting surveys are conducted by using scopes or binoculars to search for chuckwalla on rock outcrops. Surveys should be conducted when air temperatures do not exceed 40 degrees C (104 F). Surveys should be conducted during active season, i.e., mid-February to early June. During most years, mid-summer and winter surveys should be avoided. These surveys are conducted by several biologists, searching a small outcrop 2.5 to 7.5 acres for an hour or until a chuckwalla is seen, whichever comes first, then, moving to the next site.

Scat Surveys (this method is more effective). Scat surveys are conducted by several biologists who search an area less than 2.5 to 7.5 acres for 1 hour or until scat is located, whichever comes first. Surveys should be conducted using meandering transects to identify "valid chuckwalla scat" defined as generally at least 30 mm (1.2 inches) long and on rock outcrops where tortoises typically would not climb. The surface of rock should be recorded to determine if it is smooth or cracked, which would stop and trap scat.

2.3 Additional Survey Methods To Be Considered

Night Reptile Surveys. The roadless characteristic of Sloan NCA makes nocturnal surveys for reptiles difficult and more expensive than for roaded areas (e.g., Redrock Canyon NCA). The majority of reptile species surveys would need to be similar to these suggested for western chuckwalla.

Anabat Technology. It would be especially important to identify members of the bat community in Sloan NCA with the surveys using Anabat technology. This technology is used to detect the auditory signatures of bat species while feeding and to record the data on an associated computer.

Nesting Raptors. Surveys for nesting hawks can be conducted on foot or by helicopter. Surveys for burrowing owls include searching for adult owls with young when actively hunting for prey and searching for burrows because burrowing owls often use unoccupied desert tortoise burrows for shelter and nesting in season. Regular visits to cliff areas would reveal the presence of kestrels and great horned owls.

Mammal Surveys. NDOW would survey desert bighorn sheep according to the statewide protocol. NDOW, with the cooperation of BLM staff, would conduct the translocation of bighorn sheep on an as-needed basis.

One technique that can help determine the presence of mammalian predators (e.g., kit fox, gray fox, ringtails, bobcat, cougar, and coyote) is to place remote sensing camera arrays (camera traps) in the NCA. Scat and track surveys can be conducted for all the mammal species listed. Nocturnal spotlight surveys

can be used by personnel on foot in the NCA for most mammals. It is also possible to use trained dogs to help locate scats, kit fox dens, and fox use areas (although this method requires extensive training of the dogs employed). Kit fox should be in the vicinity of the water project because of the abundance of quail and other birds and insects.

Avian Surveys. In 2004, BLM personnel in the Sloan Canyon Area of Critical Environmental Concern, in cooperation with Great Basin Bird Observatory, conducted a point count survey of birds. This type of survey should be continued within the Petroglyph Management Area and expanded to other NCA areas during the breeding season to gather annual data about presence and density of nesting species.

The known nest sites of hawks, owls, and eagles (when located) should be visited and surveyed annually. At the time of this document's preparation, nesting owls were suspected in the NCA. Kestrel nest-sites and red-tailed hawk nests have been documented.

Winter surveys of the NCA would determine the extent and variety of the species using the habitat annually or periodically. NDOW indicates that Sloan Canyon is an important winter area for Merlin falcons. The importance of the Colorado River and its reservoirs for California condor and for bald and golden eagles indicates that Sloan may occasionally become usable habitat for these species but would not likely be used regularly.

Marking individual birds can be helpful in determining home range and seasonal use of a habitat by numerous species. Mist nets are a standard method for capturing birds for banding and other marking studies. Such studies may be warranted if general monitoring techniques indicate severe population changes.

3.0 PLANTS

The Blue Diamond cholla is a Nevada State plant species of concern found in limited areas of Sloan Canyon NCA. Any developments, facilities, and trails in the NCA must be sensitive to the distribution of this plant in the NCA. Any disturbance of this species would require BLM permitting.

Several penstemon species are BLM sensitive and may be found in the various washes in the NCA. Steps should be taken to mitigate fragmentation of these populations when developments, facilities, and trail construction take place in the NCA.

4.0 INVERTEBRATES

Little is recorded about the insects and other invertebrate species native to Sloan Canyon NCA. The actual community of these species is likely to be much larger and more diverse than is suggested by the following list. These representatives have been recorded in the NCA by various observers: desert cockroach (*Arenivaga sp.*), various flies of the order Diptera, pallid-winged grasshoppers (*Trimerotropis pallidipennis*), mud dauber wasp (*Sceliphron caementarium*), pepsis wasp or tarantula hawk (*Pepsis sp.*), velvet ant (*Dasymutilla gloriosa*), harvester ant (*Pogonomyrmex sp.*), funnel web spider (*Agelenopsis sp.*), orb weaver of the family Araneidae, desert recluse spider (*Loxosceles deserta*), black widow spider (*Latrodectus hesperus*), tarantula (*Aphonopelma sp.*), centipede (*Scolopendra sp.*), devil scorpion (*Vaejovis confuses*), giant desert scorpion (*Hadrusus spadix*), pinacate beetle (*Eleodes sp.*), honey bee (*Apis sp.*), and various moths and butterflies of the order Lepidoptera. The information about invertebrates is based on studies by Alex L Heindl of the University of Nevada, Las Vegas.

Various standard entomological survey techniques can be used to determine a baseline level for invertebrates in Sloan Canyon NCA: net sweeps, attracting specimens to nocturnal light traps, and other methods for specific conditions.

5.0 BIOLOGICAL SURVEY EXAMPLE

The following documents an example of a one-half day survey conducted in the Sloan Canyon NCA:

June 28, 2004, 7:00 a.m. until about noon

Bird Observations

Rock wren—several pairs, individual adults and young of the year.

- Black-throated sparrow
- Horned lark
- Gambel quail
- Common raven
- Young of year redtail hawk, possible prairie falcon
- Ash-throated flycatcher
- Say's phoebe (no swallows or swifts seen).

Mammals

- Antelope ground squirrels—a common sighting
- Nelson's desert bighorn sheep—tracks and droppings seen often in upper reaches of canyon and near the big game water project. Bones found were likely those of a young male desert bighorn (e.g., hip girdle, ribs, shoulder blade, no skull found)
- Bobcat droppings seen on four to six locations in the washes
- Cougar droppings seen twice
- Coyote tracks and droppings seen in many parts of the canyon
- No obvious droppings or tracks of any foxes.

Reptiles

The contractor saw adult and hatchling desert tortoise in Sloan Canyon NCA, but we did not find tortoise or sign on this date. We did not see Gila monster or sign during this visit.

We did not see any snakes during this visit. Although it was 89 degrees to a high of about 94 degrees while we were in the NCA, there was a very pleasant and strong wind blowing to help cool us as we worked. We looked diligently for chuckwalla in the normal locations, but we did not see even one. We did see the following lizards:

- Uta—side-blotched lizard—saw 8 to 11 (most common reptile in Sloan NCA)
- Leopard lizard—saw two individuals
- Desert Iguana—one or two seen

- Whiptailed lizard—a common sighting (about seven seen)
- Desert horned lizard—one seen, captured, and released
- Ants (the principal food for horned lizards)—seemed abundant in upper reaches of canyon
- Collared lizard—one very colorful specimen on a cliff above the water project
- Spiny desert lizard—one seen. We did not find any amphibians.

APPENDIX I

Biological Opinion

United States Department of the Interior

FISH AND WILDLIFE SERVICE
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Reno, Nevada 89502
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LAS VEGAS NEVADA

April 20, 2006
File No. 1-5-06-F-416

Memorandum

To: Sloan Canyon National Conservation Area Manager, Las Vegas Field Office, Bureau of Land Management, Las Vegas, Nevada

From: Field Supervisor, Nevada Fish and Wildlife Office, Reno, Nevada

Subject: Programmatic Biological Opinion for Implementation of Actions Proposed in the Sloan Canyon National Conservation Area Resource Management Plan, Clark County, Nevada

This document transmits the U.S. Fish and Wildlife Service's (Service) programmatic biological opinion based on our review of programmatic activities proposed for implementation by the Bureau of Land Management (BLM), as described in your September 2005, biological assessment (BA) (BLM 2005a), and its effects on the threatened Mojave desert tortoise (*Gopherus agassizii*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*). Critical habitat designated for the desert tortoise is not anticipated to be adversely affected by the proposed action, thus we determined that further analysis of critical habitat is not necessary. Future BLM actions that may adversely affect the desert tortoise may be appended to this biological opinion which will be assigned the same consultation number followed by ".APD," then the project/action number (*e.g.,* 1-5-06-F-416.APD1).

This biological opinion is based on information provided in the BA; September 2005 Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (EIS) for the Sloan Canyon National Conservation Area (NCA) (BLM 2005b); July 16, 2003, draft Service guidance for programmatic biological opinions (Attachment A); September 22, 2005, memorandum from BLM to the Service; discussions and electronic mail between the Service and BLM staff; and our files. The Service requested additional information from BLM on December 29, 2005, and received a response with the requested information on January 27 and February 23, 2006. A complete administrative record of this consultation is on file in the Southern Nevada Field Office, Las Vegas, Nevada.

TAKE PRIDE IN AMERICA

Programmatic Consultations

This biological opinion was prepared in accordance with the July 16, 2003, draft guidance for programmatic-level consultations (Attachment A). The term "programmatic consultation" has become a generic term encompassing a broad category of section 7 consultations that evaluate the potential for Federal agency programs to affect listed and proposed species, and designated and proposed critical habitat. Such programs typically guide implementation of future agency actions by establishing standards, guidelines, or governing criteria to which future actions must adhere. At times the term *programmatic consultation* has been used to refer to consultations on a large group of similar actions (*e.g.*, a national forest's timber harvest program for a particular year) as well as to refer to consultations covering different types of actions proposed within a large geographic area, such as a watershed. Such consultations can provide the benefit of streamlining the consultation process while leading to a more landscape-based approach to consultations that can minimize the potential "piecemeal" effects that can occur when evaluating individual projects out of the context of the complete agency program.

This programmatic biological opinion analyzes the potential effects of implementing BLM's proposed actions within the Sloan Canyon NCA and develops the appropriate project-specific documentation that addresses the effects of individual projects. This programmatic biological opinion contains all of the elements found in a standard biological opinion. The format of this programmatic biological opinion conforms to the *appended programmatic consultation approach*, which will require that BLM and the Service produce project-specific documentation that is physically appended to this programmatic biological opinion **before** the action occurs. The Service encourages BLM to use the attached form (Attachment B) to facilitate processing future actions to be appended to this biological opinion.

Project-level Consultation under the Appended Programmatic Consultation Approach

As individual projects are proposed under the appended programmatic consultation approach, BLM will provide project-specific information that: (1) describes each proposed action and the specific areas to be affected; (2) identifies the species and critical habitat that may be affected; (3) describes the manner in which the proposed action may affect listed species; (4) describes the anticipated effects; (5) specifies, if appropriate, that the *anticipated effects from the proposed project are consistent with those anticipated in the programmatic biological opinion*; (6) describes proposed measures to minimize potential effects of the action; and (7) describes any additional effects, if any, not considered in the programmatic consultation.

The Service reviews the information and effects analysis provided for each proposed project and this project-specific review is documented in accordance with the guidance provided below. To initiate the project-specific review, BLM's project information and effects analysis should be accompanied by a cover letter that specifies that the action agency has determined that the proposed project is consistent with the programmatic biological opinion, and requests that the

proposed project be appended to the programmatic biological opinion to fulfill BLM's consultation requirements. In this programmatic biological opinion, the Service determined the overall anticipated incidental take for all proposed BLM activities in the action area over a 10-year period, at the programmatic level. As each action is submitted by BLM to the Service to be appended to this programmatic biological opinion, the Service will determine the anticipated incidental take for each action, at the project level, as a subset of the incidental take anticipated in the programmatic biological opinion. BLM shall be responsible for accurately reporting any incidental take of listed species to the Service that occurs in association with actions covered under this programmatic biological opinion. This process is a modification of the appended approach which involves only programmatic-level incidental take statements.

Individual BLM actions that are *likely to adversely affect* listed species shall require a memorandum from the Service to BLM that contains:

(1) a summary of any information not identified in the programmatic consultation document used to evaluate the effects of the proposed action;
(2) a short project summary as provided by BLM;
(3) a detailed discussion of the effects of the proposed action on listed species and critical habitat;
(4) a statement regarding the specific project's effects to the environmental baseline, including a restatement of the amount of take that is anticipated and a tallying of the overall effects to the environmental baseline from projects implemented under the programmatic consultation to date;
(5) any additional project-specific reasonable and prudent measures and/or terms and conditions needed to ensure the minimization of the effects of the take that will result from the proposed project; and,
(6) language that appends the project to the programmatic consultation and associated incidental take statement, if appropriate.

Although there is no standard for the required project-specific documentation, the Service generally should complete its response in approximately two pages and within 45 days. This documentation is then physically attached (appended) to the programmatic biological opinion in an appendix. Therefore, the programmatic biological opinion, together with the appended documentation, fulfills the consultation requirements for implementation of both program-level and project-level actions.

Monitoring shall be conducted at least annually by BLM and the Service to assure that the effects analysis in the programmatic biological opinion is accurate including a comprehensive review of how the program-level biological opinion is working, and whether its implementing procedures are in compliance. During this review, the environmental baseline should be reviewed and updated as needed to account for unanticipated effects or the lack of anticipated effects. During

this process it may be determined that the program-level biological opinion is functioning as anticipated and, therefore, activities should continue, or that adjustments should be made.

Consultation History

On November 25, 2003, BLM requested a species list from the Service for the Sloan Canyon NCA. We provided a species list as requested on December 22, 2003, which included the Mojave desert tortoise as the only federally-listed species anticipated to occur within the Sloan Canyon NCA.

BLM requested formal consultation for the subject action by memorandum dated September 20, 2005. The Service received BLM's request on September 22, 2005, at which time formal consultation was initiated.

A. BIOLOGICAL OPINION

I. Description of the Proposed Action

The proposed action for this consultation is BLM's approval of the Sloan Canyon NCA RMP and implementation of resource and land-use management programs within the Sloan Canyon NCA over the next 10 years, which are described in the BA and Proposed RMP/EIS for the Sloan Canyon NCA. The proposed Sloan Canyon RMP provides for moderate levels of developed recreation, facilities, and transportation with management actions to ensure that resources or visitor experiences are not unacceptably degraded. There are currently no BLM-approved facilities in the action area. Several dirt roads would provide access into the NCA. A comprehensive interpretive plan is included in the Proposed RMP/EIS. The Proposed RMP/EIS includes the North McCullough Wilderness Management Plan. The Executive Summary and Chapter 2 of the Proposed RMP/EIS describe the range of wilderness management actions as analyzed in Chapter 4 of the document.

Due to the funding uncertainty and adaptive management needs, all future actions in the NCA cannot be predicted at this time. If a "new" activity is proposed that may not have been specifically identified in the proposed action or BA, and the potential effects to the desert tortoise that may result from a similar activity have been adequately addressed in this biological opinion, coverage for such new actions may be included as part of this consultation; however, the effects to the desert tortoise must be within the scope of analysis for this biological opinion. Actions proposed to occur in the action area that would result in effects to the desert tortoise beyond those considered in this biological opinion may require further consultation.

In 2002, Congress legislated the Clark County Conservation of Public Land and Natural Resources Act of 2002, which designated and established the 48,438 Sloan Canyon NCA and the

North McCullough Wilderness. The Sloan Canyon NCA, which includes the 14,763 acre McCullough Wilderness, is the action area for this consultation (Figure 1). These lands are managed by BLM's Las Vegas Field Office, Clark County, Nevada.

The Sloan Canyon NCA encompasses the northern portion of the McCullough Range and occurs southeast of Las Vegas on the border of the City of Henderson in southern Nevada. The northernmost boundary of the Piute-Eldorado Desert Tortoise Critical Habitat Unit occurs approximately 3 miles south of the southern boundary of the Sloan Canyon NCA. Elevations within the Sloan Canyon NCA range from 1,800 feet on the southern end to 5,000 feet at Black Mountain.

The Sloan Canyon NCA is comprised of four Management Emphasis Areas (MEA) which provide a general framework for managing uses within a particular area. These MEAs are: (1) Developed, (2) Roaded Natural, (3) Semi-primitive, Non-motorized, and (4) Primitive (Figure 2).

1. Developed MEAs (396 acres) - generally includes areas that will have substantial modification of the natural environment. These sites will have intensified motorized use, a large amount of parking availability, a moderate to high level of human interaction, and widely available visitor support facilities. The north access to Sloan Canyon NCA where the proposed visitor's center would be located would be zoned as Developed.

2. Roaded Natural MEAs (15,643 acres) - typically has developments limited to improved access and those consistent with the natural environment. The recreational experience in this zone is based on the natural setting, and may include roads, trails and unimproved camping areas. Human interaction at this site is low to moderate, with the majority being low. Onsite controls are subtle and this zone includes areas with existing dirt roads. This zone encompasses the area north of McCullough Road and Trail right-of-way and trailheads.

3. Semi-primitive, non-motorized MEAs (17,816 acres) - contains areas that may not necessarily be remote and may be relatively accessible but human interaction level is low. Opportunities provided in this zone include trails for mountain bikes, horse riding, and hiking. Existing roads are closed and have been converted to trails and all motorized use is prohibited. Off-site controls are preferred, and facilities are avoided but may be provided for resource protection or user safety. This area includes the Petroglyph Management Area.

4. Primitive MEAs (14,595 acres) - contains areas where the user assumes more risk, and self-reliance is necessary. These are remote areas away from primary travel routes and are not easily accessed. Any access to the sites occurs by hiking and horseback as mechanized vehicles are prohibited. Human interaction is rare to low and evidence of other users is minimal. No onsite controls or facilities are provided except those required for resource protection. These areas include the North McCullough Wilderness Area.

Figure 1. Sloan Canyon NCA Planning Area

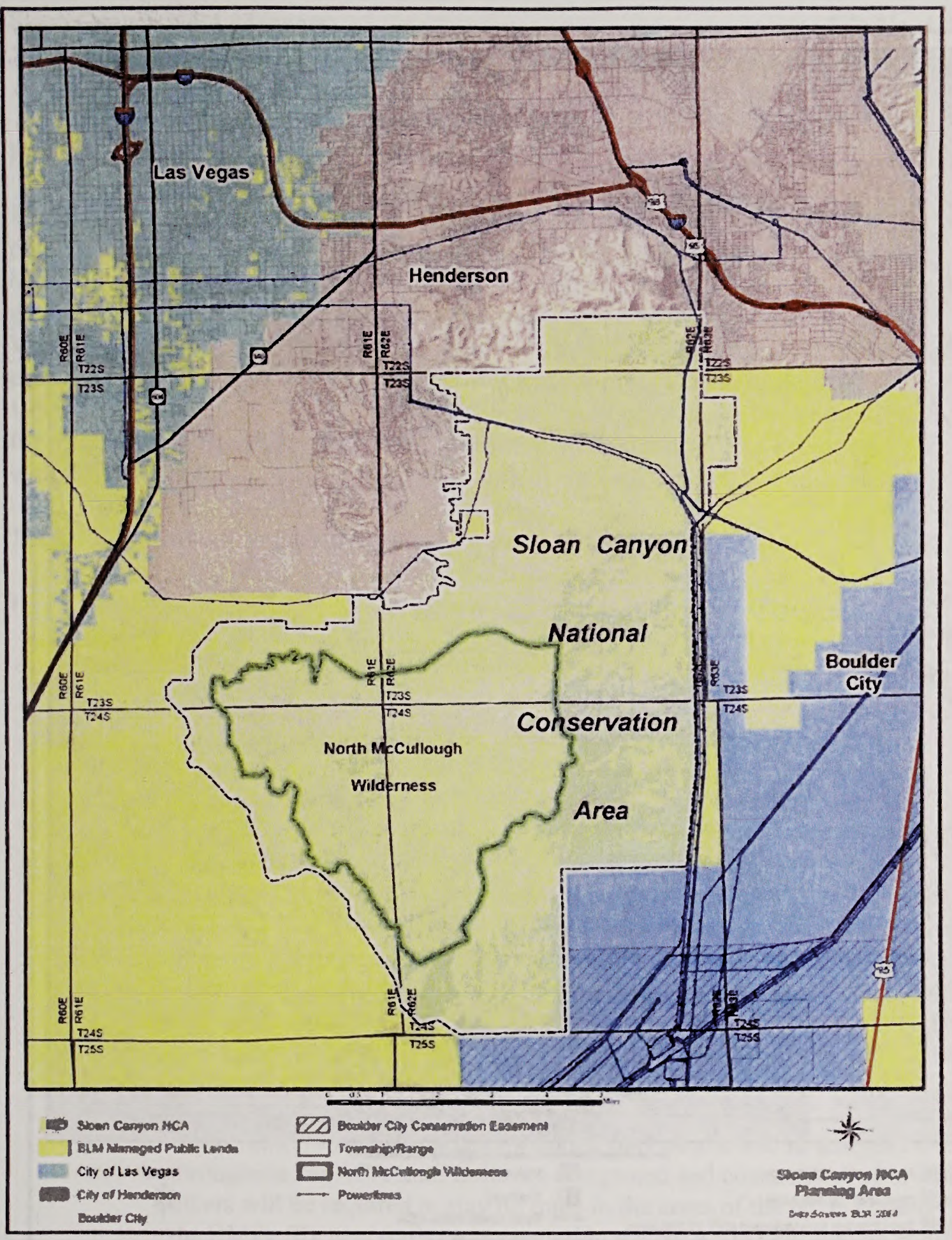
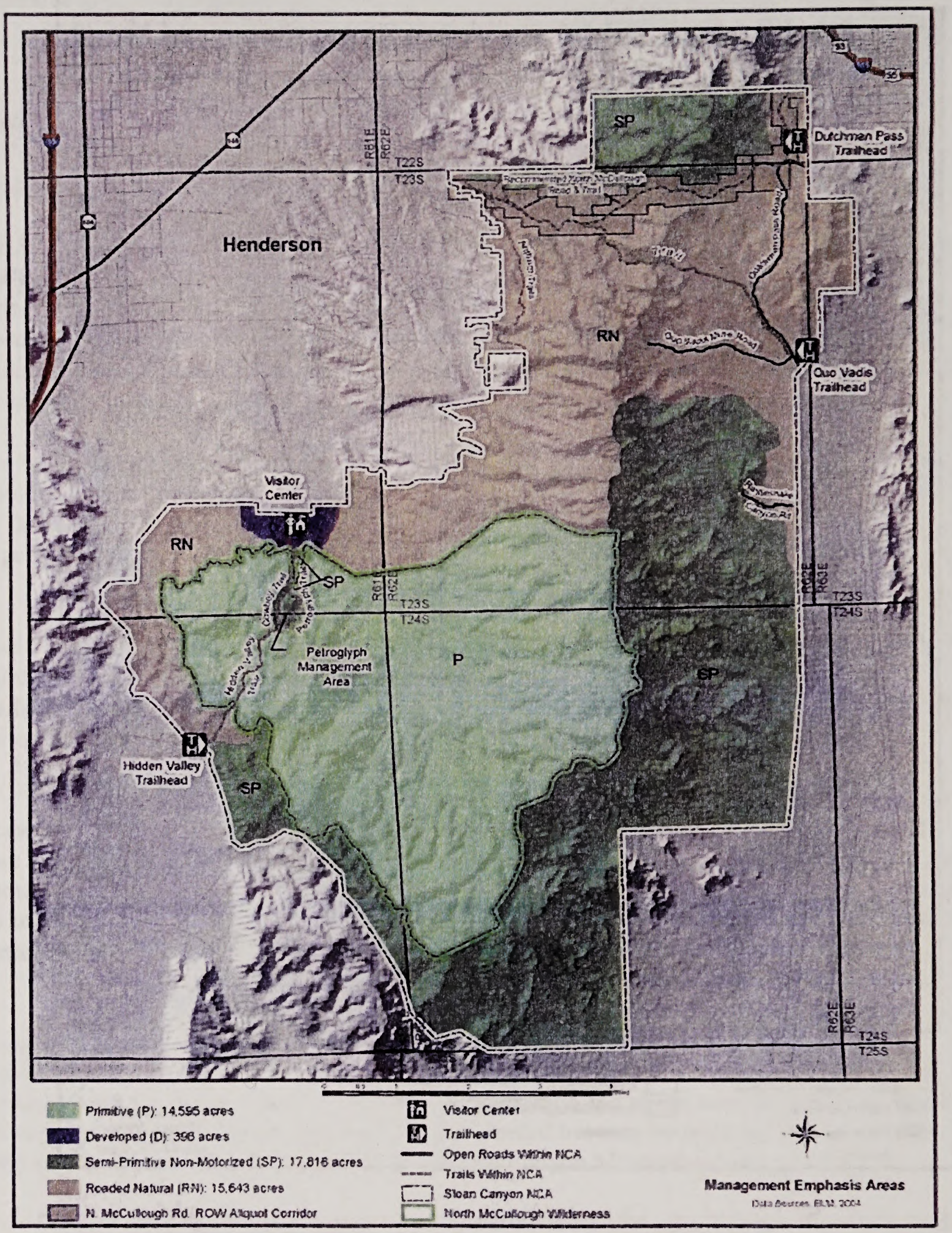


Figure 3. Management Emphasis Areas



Programs Proposed for Implementation under the Sloan Canyon NCA RMP

The BLM identified five program areas in the Sloan Canyon RMP that may include activities that may result in adverse effects to the desert tortoise in the Sloan Canyon NCA. Within the North McCullough Wilderness, such actions are primarily recreation-related, but also include livestock grazing. BLM's consultation responsibilities for management of livestock within the Hidden Valley Allotment, the only allotment in the NCA, were fulfilled by the 1998 programmatic consultation for lands administered by BLM's RMP for Las Vegas (Biological Opinion No. 1-5-98-F-053, as amended), which remains valid. BLM proposes no new range improvements for livestock grazing within the NCA. Wildfire suppression activities will occur in accordance with BLM's 2004 Fire Management Plan and will not be addressed in this consultation.

The five programs of activities proposed in the RMP are discussed below:

1. <u>Recreation and Visitor Management</u>

BLM anticipates that the recreation activities in the action area would include hiking, mountain biking, equestrian use, rock-climbing, dog exercise, hunting, nature study, sightseeing, and dispersed camping. Special Recreation Permits (SRP) would be issued on a case-by-case basis. No vending or competitive SRPs would be issued for the Wilderness. Geo-caching, recreational target shooting, rock hounding, and off-highway vehicle (OHV) use would not be allowed in the Sloan Canyon NCA. Dogs would be allowed on a leash in designated areas only. Dogs would be required to be on-leash in designated areas and prohibited in the remainder of the NCA; animal waste will be removed by the individual responsible for controlling the dog.

Visitation and resource monitoring would be used to assess and establish the baseline resource conditions for the NCA, then document any changes to the baseline. Once the resource baselines are determined, a system such as Limits of Acceptable Change may be used to establish thresholds for future actions.

a. *Hiking and trails*: Cross-country hiking may be allowed in designated areas throughout the NCA until trails are designated and constructed, after which time hikers will be required to stay on trails in the areas of the NCA as designated in the RMP. Six new trails are proposed in the NCA: (1) Petroglyph Hiking Trail, (2) Cowboy Hiking Trail, (3) Hidden Hiking and Equestrian Trail, (4) Anthem Hiking and Biking Trail, (5) North McCullough Hiking, Biking, and Equestrian Trail, and (6) and an unnamed hiking, biking, and equestrian trail associated with the east-west powerline road. Additional trails may be added to the NCA as needed, provided their design and construction would not substantially impact the NCA resources. Cross-country hiking will continue to be allowed in other areas. No new trail development is permitted without BLM authorization. An

interdisciplinary BLM team will review all new construction. All trails would be monitored and additional protective measures will be implemented as needed. BLM will evaluate all existing unauthorized or social trails and determine if they are to be closed and rehabilitated, or adopted into the trail system.

b. *Equestrian use:* Cross-country equestrian use may be allowed in designated areas until trails are designated and constructed, after which time equestrian users will be required to stay on trails in the areas of the NCA as designated in the RMP. Cross-country equestrian use will continue to be allowed in other areas. Animal waste will be removed from the trailheads by the responsible recreationists. Horse feed and hay must be certified weed-free.

c. *Mountain bike use:* The use of mountain bikes is restricted to the designated roads and trails. Cross-country mountain bike use, as well as use in the North McCullough Wilderness, is prohibited.

d. *Camping:* Primitive, dispersed camping would be allowed in designated areas of the NCA. Campfires would be allowed only at camping sites, using fire pans or fire blankets, and all fuels would be required to be packed in and out. No natural fuels in the NCA could be used for campfires, thus BLM encourages the use of portable stoves.

2. Transportation

Potential access points into the NCA include the northern access to Sloan Canyon, Hidden Valley, Dutchman Pass, Quo Vadis, and Sutor Hills. A 20 acre visitor center may be constructed near the NCA boundary at the northern entrance to the NCA to also serve as an access point to the Sloan Canyon Petroglyph Site, and provide onsite resource protection and interpretation. The Hidden Valley Trailhead development may result in less than 0.5 acre of disturbance which includes a developed trailhead with a gravel parking lot to accommodate 15 cars, an interpretive kiosk, and a vault toilet. Dutchman Pass Trailhead may result in 0.5 acre of disturbance which may include a developed trailhead, a gravel parking lot to accommodate 30 cars, an equestrian staging area, an interpretive kiosk, and a vault toilet. The Quo Vadis access point may include a developed trailhead, a 0.5 acre gravel parking, an interpretive kiosk, and a vault toilet. The Sutor Hills access point may include a developed trailhead, a gravel parking to accommodate five cars, an interpretive kiosk, and a vault toilet; total disturbance is estimated at 0.1 acre. No new access roads are proposed except for the congressionally mandated north McCullough Road.

Occasionally, unauthorized cross-country driving or vehicle-dumping occurs within the NCA. These incidents are typically handled by law enforcement through such means as

vehicle recovery and photography. In some cases, the recovery actions can create a greater degree of habitat disturbance than the initial trespass action; however, these actions are pursued with restoration at the cost of the trespasser.

3. Permits (Commercial, Filming or Research Monitoring)

Special Recreation Permits may be issued for all commercial trail guiding operations. No filming, competitive, or vending SRPs will be issued for activities within wilderness. *Competitive* SRPs are issued for events and activities that include an element of competition such as a running race. *Vending* SRPs are temporary authorizations to sell goods or services on public lands, and are typically issued in conjunction with a recreation activity. Permitted filming activities will be limited to designated trails and trailheads and up to 15 people.

4. Habitat Restoration, Weed-Control, and Wildlife Management

BLM proposes to manage vegetation to promote native plant communities and restore the plant productivity of disturbed areas (Appendix H). The Proposed RMP/EIS includes a Vegetation Restoration Strategy which describes BLM's vegetation restoration activities including project prioritization, restoration methods, and existing and future disturbance. In the Strategy, BLM proposes to manage noxious weeds in accordance with integrated weed management principles and the general restoration strategy for BLM's Las Vegas Field Office.

BLM proposes to maintain existing wildlife water developments consistent with the Memorandum of Understanding between BLM and the Nevada Department of Wildlife for wildlife management in the Wilderness. BLM may authorize animal damage control activities as a management tool, which may include removal of feral animals such as wild horses and burros. BLM proposes to conduct wildlife monitoring surveys in the NCA and provide interpretive information to the public. BLM proposes to rehabilitate existing disturbances that are no longer in use, including closed roads.

5. Lands, Realty, and Mineral Development

BLM will consider applications for new rights-of-way or amendments to existing rights-of-way on a case-by-case basis within the NCA, if the action furthers the purpose of the NCA. No areas within the NCA are proposed for disposal. Any released hazardous materials would be removed and remediated. No economic metallic minerals, uranium, thorium, or economically viable nonmetallic mineral deposits have been found within the NCA. Except for valid, existing rights, all public land is withdrawn from location, entry, and patent under the mining laws, and operation of the mineral and geothermal leasing laws. Within the NCA boundary, there are 11 active mining claims, 9 of which are not

validated. BLM does not anticipate any mineral development within the NCA during the term of this consultation. Abandoned mines may be closed and backfilled.

Proposed Conservation Measures

The Service anticipates that BLM will request that specific projects or actions be included as an appendix to this programmatic biological opinion (*i.e.*, appended) in accordance with Service guidance on programmatic consultation procedures. The measures below are proposed by BLM at the program level, to minimize potential effects of future actions appended to this biological opinion, as determined appropriate. When a future action is identified for inclusion under this programmatic consultation, BLM will recommend project-specific measures which may be a subset of the measures below and may include additional measures that BLM has determined are appropriate to minimize the potential effects of the action. In response, the Service will incorporate the appropriate recommended measures, as well as any additional measures or modifications of the proposed measures, into project-specific terms and conditions. The measures below demonstrate BLM's commitment to minimize the potential effects of future actions and are part of the analysis of effects of programmatic activities on the desert tortoise.

***Proposed Measures for All Activities*:**

1. *Speed limit:* Within Clark County, the speed limit is 25 miles-per-hour on unposted county roads; this speed will be established for all activities at all times unless otherwise designated.

2. V*ehicles:* All project/event-related individuals shall check underneath stationary vehicles before moving them.

3. *Vehicle traffic*: Shall be restricted to designated roads, except for emergency and administrative-related traffic.

4. *Litter-control*: Will be implemented and enforced by the project proponent or BLM. Trash containers shall remain covered, must be raven-proof, and emptied frequently enough to prevent overflow of materials. Trash, litter, project debris, etc. shall be transferred to a designated solid waste disposal facility. Vehicles hauling trash must be secured to prevent litter from blowing out along the road.

5. *Tortoise mortality/injury:* BLM wildlife staff (702/515-5000) and the Service (702/515-5230) must be notified of any desert tortoise death or injury in the NCA by close of business on the following work day. In addition, the Service's Division of Law Enforcement shall be notified in accordance with the reporting requirements of this biological opinion.

6. *Tortoise activity:* The period of greatest tortoise activity is generally defined as March 1 – October 31. However, unseasonably warm weather and/or precipitation outside this period may result in tortoise activity, particularly by hatchling and juvenile tortoise, and thus warrant adherence to requirements established for periods of greater activity. Similarly, BLM may determine that additional measures are appropriate for projects planned for the end or beginning of either period if conditions are suitable for desert tortoises to be active.

7. *Education Program:* A BLM or Service-approved biologist (as defined below) shall facilitate a tortoise education program to all supervisors, workers, permittees and other employees or participants involved in projects covered under the Sloan Canyon NCA RMP. The program will consist of either a presentation or fact sheet as determined by project-level consultation between BLM and the Service, and will include information on the life history of the desert tortoise, legal protection for desert tortoises, penalties for violations of Federal and State laws, general tortoise activity patterns, reporting requirements, measures to protect tortoises, terms and conditions of the biological opinion, and personal measures employees can take to promote the conservation of desert tortoises. "Take," which is defined to include any harm or harassment to desert tortoise, including significant habitat modification, will also be explained. Workers and project associates will be encouraged to carpool to and from the project sites. Specific and detailed instructions will be provided on the proper techniques for capturing and moving tortoises which appear onsite if appropriate. These instructions will be in accordance with Service-approved protocol. Currently, the Service-approved protocol is Desert Tortoise Council 1994, revised 1999.

8. *Biologist approval:* BLM and Service wildlife staff must approve the biologists who would be assigned to implement the terms and conditions of the biological opinion, or permit issued by BLM. Any biologist not previously approved must submit a statement of qualifications in the Service-developed format and be approved by the wildlife staff, before authorized to represent BLM in meeting compliance with the terms and conditions of the biological opinion. Other personnel may assist with implementing conservation measures, but must be under direct field supervision by the authorized biologist.

9. *Biologist qualifications:* In accordance with *Procedures for Endangered Species Act Compliance for the Mojave Desert Tortoise* (Service 1992), an authorized desert tortoise biologist should possess a bachelor's degree in biology, ecology, wildlife biology, herpetology, or closely related fields as determined by BLM and the Service. The biologist must have demonstrated prior field experience using accepted resource agency techniques to survey for desert tortoises and tortoise sign, which should include a minimum of 60 days field experience. All tortoise

biologists shall comply with the Service-approved handling protocol (Desert Tortoise Council 1994, revised 1999). In addition, the biologist shall have the ability to recognize and accurately record survey results and must be familiar with the terms and conditions of the biological opinion that resulted from project-level consultation between BLM and the Service.

10. *Tortoises in harm's way:* If a tortoise is found within the project/activity site in harm's way, all potentially harmful activity shall cease until the tortoise moves or is moved out of harm's way by an authorized biologist. If a desert tortoise is in *imminent danger*, the tortoise shall be moved out of harm's way and on to adjacent BLM land, using techniques described in the tortoise education program.

11. *Moving tortoises:* Tortoises that are moved offsite and released into undisturbed habitat on public land, must be placed in the shade of a shrub, in a natural unoccupied burrow similar to the hibernaculum in which it was found, or in an artificially constructed burrow in accordance with the tortoise handling protocol. Tortoises encountered shall be treated in a manner consistent with the appropriate measures in this biological opinion.

12. *Permits:* All appropriate State and Federal permits, including NDOW permits for handling desert tortoises or their parts, must be acquired by the tortoise biologists or other personnel before project initiation and prior to handling any desert tortoise or their parts, or conducting any activity requiring a permit.

13. *Project oversight:* One or more BLM representatives shall be designated who will be responsible for overseeing compliance with the reasonable and prudent measures, terms and conditions, reporting requirements, and reinitiation requirements identified in this biological opinion. The designated representatives shall provide coordination among the permittee, project proponent, BLM, and the Service.

14. *Desert tortoise burrows*: Will be avoided whenever possible; if not, the burrow will be cleared in accordance with the measures set forth in this biological opinion.

15. *Heat stress:* Desert tortoises encountered experiencing heat stress will be placed in a tub, by an authorized tortoise biologist, with one inch of 76-90°F (24-32°C) water for at least 20 minutes or until heat stress symptoms are no longer evident.

16. *Temperature restrictions:* Desert tortoises shall be treated in a manner to ensure that they do not overheat, exhibit signs of overheating (*e.g.*, gaping, foaming at the mouth, etc.), or are placed in a situation where they cannot maintain surface and

core temperatures necessary to their well-being. Desert tortoises shall be kept shaded at all times until it is safe to release them. No desert tortoise shall be captured, moved, transported, released, or purposefully caused to leave its burrow for whatever reason when the ambient air temperature is above 95°F (35°C). Ambient air temperature shall be measured in the shade, protected from wind, at a height of 2 inches (5 centimeters) above the ground surface. No desert tortoise shall be captured if the ambient air temperature is anticipated to exceed 95°F (35°C) before handling and relocation can be completed. If the ambient air temperature exceeds 95°F (35°C) during handling or processing, desert tortoises shall be kept shaded in an environment that does not exceed 95°F (35°C), and the animals shall not be released until ambient air temperature declines to below 95°F (35°C).

17. *Reporting:* Within 30 days of completion of a project, the project proponent, permittee, or BLM must submit a document to a BLM wildlife biologist showing the number of acres disturbed, remuneration fees paid, and number of tortoises observed or taken, which includes capture and displacement, killed, injured, or harassed by other means, during implementation of programmatic actions.

18. *Previous disturbance:* Overnight parking and storage of equipment and materials, including stockpiling, shall be within previously disturbed areas or within areas cleared by a tortoise biologist to minimize habitat destruction.

19. *Project boundaries:* Project activity areas will be clearly marked or flagged at the outer boundaries before the onset of construction. All activities shall be confined to designated areas. When new access routes have been identified for development, the tortoise biologist will flag routes before surface disturbance.

Proposed Measures for Actions Involving Ground Disturbance:

20. *Blading of vegetation:* Will occur only to the extent necessary and shall be limited to areas designated for that purpose by BLM or a tortoise biologist.

21. *Fees:* Before issuance of authorization, and before any surface-disturbing activity, BLM or the project proponent shall pay a remuneration fee ($705 per acre of surface disturbance, if paid prior to March 1, 2007). This rate is indexed annually for inflation based on the Bureau of Labor Statistics Consumer Price index for All Urban Consumers (CPI-U). Information on the CPI-U can be found on the internet at *http://stats.bls.gov/news.release/cpi.nws.htm*. An exception to the requirement is made if the disturbance for the project is less than 0.25 acre of disturbance or for activities that result in a long term benefit for the species (*e.g.*,

trail realignment to minimize habitat impacts). Fee payment shall be submitted with the completed form in Attachment C.

22. *Notification:* The project applicant/BLM lead shall notify the BLM wildlife staff representative responsible for NEPA review of the project, at least 10 days before initiation of the project (702 515-5000).

23. *Clearance:* All project areas, fence lines, staging areas, etc. will be cleared of tortoises by an authorized biologist immediately before the start of ground disturbance using 100-percent coverage survey techniques. During the tortoise active season, an authorized tortoise biologist will be onsite during fence construction to ensure that no tortoises are harmed. Burrows found outside the area to be disturbed, will be flagged and avoided. Clearance will involve excavating nests; relocating eggs; flagging avoidable burrows; collapsing unavoidable, unoccupied burrows; and relocating tortoises in accordance with the Service-approved protocol for handling desert tortoises (Desert Tortoise Council 1994, revised 1999). If disturbance is planned to occur during a period when tortoise are not anticipated to be active, surveys may be conducted earlier as determined during project-specific consultation.

24. *Fencing:* The height of all tortoise-proof fencing will be a minimum of 18 inches above ground. Fencing may be permanent or temporary as determined on a project-level basis. Temporary fence design should consist of 1-inch horizontal by 2-inch vertical mesh (hardware cloth or plastic) and be installed flush with the ground. Temporary tortoise-proof fencing should not be buried unless otherwise directed by BLM. Permanent tortoise-proof fencing will consist of 1-inch horizontal by 2-inch vertical wire mesh. Where feasible, the fence will be buried 6 to 12 inches below ground. In situations where it is not feasible to bury the fence, the lower 12 inches of the fence shall be bent at a 90-degree angle towards the potential direction of encounter with tortoise and covered with cobble or other suitable material, to ensure that tortoise or other animals cannot dig underneath and create gaps through which tortoises may traverse.

25. *Clearance following fence construction:* Prior to the commencement of project activities, all desert tortoises shall be removed from the site. An authorized biologist shall oversee the survey for and removal of tortoises using techniques providing 100-percent coverage of all areas. Two complete passes of 100-percent coverage will be accomplished. If on the second pass, additional tortoises are encountered, a third pass will be conducted. Clearance of the fenced area will involve activities described in Measure 23 above.

During Ground Disturbing Activities:

26. *Fence inspection/maintenance:* Fencing will be inspected daily and zero clearance will be maintained between the bottom of the fence and the ground to ensure any bent portions are properly covered. Additional monitoring and maintenance shall include regular removal of trash and sediment accumulation, and checking for rodent damage or other breeches when using temporary tortoise-proof fencing.

27. *On-site biologist:* Unless the area has been fenced and cleared, or the Service and BLM have determined an onsite biologist is not necessary through project-level consultation, the project will require at least one authorized biologist onsite for project construction during the period of greatest tortoise activity (*e.g.,* March 1 through October 31). The biologist shall be on-call at other times.

Following Termination of Ground Disturbing Activities:

28. *Fence removal:* Temporary fencing will be removed at the end of the construction activity. Permanent fencing may be removed upon termination and reclamation of the project, or when it is determined by BLM and the Service that the fence is no longer necessary.

29. *Restoration:* Temporary disturbance areas will be restored in accordance with the restoration protocols for the project.

Proposed Measures for Activities that Involve Maintenance or Modification of Existing Sites and Limited to Existing Disturbed Areas Adjacent to Tortoise Habitat:

30. *Clearance - barren/unsuitable areas:* All project areas that are barren or unsuitable for tortoises but occur adjacent to creosote-bursage or Mojave mixed scrub vegetation, will be cleared by an authorized biologist before the start of maintenance or modification. Surveys for such clearance will use 100-percent coverage survey techniques and survey/clearance will be performed no more than three days before the initiation of construction. Areas within blackbrush will be cleared only if reconnaissance surveys reveal tortoise sign within the project area.

31. *Fence high-risk areas:* If activities are expected to occur during the tortoise active season, and it is determined there is a high risk to tortoises (*e.g.*, a tortoise has been found within 1,000 feet of the project area or heavy machinery is used), the project area will be fenced with tortoise-proof fencing in accordance with Measures 23, 24, 25, 26, and 27 above.

32. *On-site biologist:* Unless the project area has been fenced and cleared; a survey has been conducted and determined that no tortoises or active burrows are within 1,000 feet of the project area; or the Service and BLM have determined an onsite biologist is not necessary, the project will require an authorized biologist(s) on-site for project construction during the period of greatest tortoise activity (*e.g.*, March 1 through October 31), and on-call at other times.

Proposed Measures for Permits:

33. *Unauthorized introductions:* The permittee shall not damage, collect, or introduce plants or animals to any location, unless specifically permitted by BLM.

34. *Existing disturbance:* All motorized vehicles, parking and activities are restricted to existing roads and existing disturbed areas; no additional ground disturbance will be allowed.

35. *Marking/infrastructure:* Painting of rocks or establishment of permanent markers or installation of permanent infrastructure is not allowed as part of these activities.

36. *Removal of materials:* The applicant is responsible for removal of any project-related materials such as flagging and markers immediately after any event or activity.

37. *Compliance:* If this project involves studies affecting species protected by the Migratory Bird Treaty Act or Endangered Species Act, before implementation of research, inventory or monitoring, proof of the Service permit authorizing this activity must be provided to BLM at:

Bureau of Land Management
Renewable Resources, Attn: Wildlife Staff
4701 N. Torrey Pines Drive
Las Vegas, Nevada 89130

38. *Reports:* Reports will be submitted to the BLM wildlife staff representative at the end of the permit period (or annually for multiple-year permits) showing the number of desert tortoises injured, killed, collected, encountered or moved as a result of the permitted activity. Additional information for collections and research permits would include the UTM coordinates or GIS coverage of the collection sites, and the number and location of species collected, associated with permitted activities.

39. *Provide data:* For research, inventory, or monitoring to collect data on desert tortoises, a copy of the study results, including any management recommendations will be submitted to the Service and the BLM wildlife staff representative upon completion of the project to aid in recovery and future management of the tortoise and its habitat.

40. *Weed-free hay and removal of waste*: Only certified weed-free hay may be used by permittees and participants associated with equestrian use. Horse and pack animal waste will be removed in trailhead areas.

41. *Temporary water troughs:* Any temporary water troughs will be removed upon conclusion of the event. If drained onsite, they will be drained in such a way as to minimize disturbance to natural wash systems.

***Proposed Measures for Restoration Activities and Mechanical Weed Treatments*:**

42. *Clearance:* All sites including cross-country access routes and staging areas will be cleared in accordance with Measure 23 and/or 30.

43. *On-site biologist or fence/clearance:* For restoration actions and weed treatment when mechanical treatments are employed, an authorized biologist must be present during periods of tortoise activity (generally from March 1 through October 31) to insure that desert tortoises are not inadvertently harmed. As an alternative to having a biologist onsite, the area may be temporarily fenced with tortoise-proof fencing. If temporary fencing is constructed, the fence line shall be surveyed by a tortoise biologist before construction of the fence. The area within the fence will be surveyed for, and cleared of desert tortoises after construction of the fence to insure that no tortoises are trapped inside the fence.

44. *Project access, vehicles:* All vehicle traffic will be restricted to designated roads except for emergency or administrative purposes in which new access routes will be created when absolutely necessary, and for which disturbance will be minimized by using the least disruptive that can accomplish the job. If there is no existing access to the site, it would not be treated or restored unless it is a hazard to desert tortoises (*e.g.*, pits or holes which may trap animals).

Proposed Measures for Wildlife Management Activities:

45. *Vehicles, access:* All vehicle use in desert tortoise habitat for these actions shall be restricted to existing roads, trails, large sandy washes, and ways. No new access roads shall be created.

46. *Disturbance:* Activities that involve ground disturbance, such as installation of water sources, fences, or other infrastructure shall comply with the proposed measures for ground-disturbing actions.

II. Status of the Species/Critical Habitat Rangewide

On August 4, 1989, the Service published an emergency rule listing the Mojave population of the desert tortoise as endangered (54 FR 42270). On April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened (55 FR 12178). Reasons for the determination included significant population declines, loss of habitat from construction projects such as roads, housing and energy developments, and conversion of native habitat to agriculture. Grazing and OHV activity have degraded additional habitat. Also cited as threatening the desert tortoise's continuing existence were illegal collection by humans for pets or consumption, upper respiratory tract disease (URTD), predation on juvenile desert tortoises by common ravens, coyotes (*Canis latrans*), and kit foxes (*Vulpes macrotis*), fire, and collisions with vehicles on paved and unpaved roads.

On June 28, 1994, the Service approved the final Desert Tortoise (Mojave Population) Recovery Plan (Recovery Plan) (Service 1994). The Recovery Plan divides the range of the desert tortoise into 6 recovery units and recommends establishment of 14 Desert Wildlife Management Areas (DWMAs) throughout the recovery units. Within each DWMA, the Recovery Plan recommends implementation of reserve-level protection of desert tortoise populations and habitat, while maintaining and protecting other sensitive species and ecosystem functions. The design of DWMAs should follow accepted concepts of reserve design. As part of the actions needed to accomplish recovery, the Recovery Plan recommends that land management within all DWMAs should restrict human activities that negatively impact desert tortoises (Service 1994). The DWMAs/Areas of Critical Environmental Concern (ACECs) have been designated by BLM through development or modification of their land-use plans in Arizona, Nevada, Utah, and parts of California.

The California Desert Conservation Area Plan (BLM 1980) as amended, is the primary plan that guides the overall management of desert tortoise habitat in California. Land-use planning activities are underway in California to complete designation of DWMAs/ACECs. Desert tortoise habitat management in Arizona is covered primarily by the Mojave Amendment to BLM's Arizona Strip Resource Management Plan, which was prepared to implement the Recovery Plan. BLM's Arizona Strip Field Office designated 167,065 acres of desert tortoise habitat as ACECs. In Nevada, BLM's Las Vegas, Ely, and Battle Mountain field offices manage desert tortoise habitat; 941,800 acres of desert tortoise habitat were designated as ACECs by the Las Vegas and Ely field offices. No desert tortoise critical habitat or proposed ACECs occur within the jurisdiction of the Battle Mountain Field Office. The regulation of activities within critical habitat through section 7 consultation is based on recommendations in the Recovery Plan (Service 1994).

Long-term monitoring of desert tortoise populations is a high priority recovery task as identified in the Recovery Plan. From 1995 to 1998, pilot field studies and workshops were conducted to develop a monitoring program for desert tortoise. In 1998, the Desert Tortoise Management Oversight Group identified line distance sampling as the appropriate method to determine rangewide desert tortoise population densities and trends. Monitoring of populations using this method is underway across the range of the desert tortoise. Successful rangewide monitoring will enable managers to evaluate the overall effectiveness of recovery actions and population responses to these actions, thus guiding recovery of the Mojave desert tortoise. Rangewide tortoise population monitoring began in 2001 and is conducted annually.

Species Account

The desert tortoise is a large, herbivorous reptile found in portions of California, Arizona, Nevada, and Utah. It also occurs in Sonora and Sinaloa, Mexico. The Mojave population of the desert tortoise includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, southwestern Utah, and in the Sonoran Desert in California. Desert tortoises reach 8 to 15 inches in carapace length. Adults have a domed carapace and relatively flat, unhinged plastron. Shell color is brownish, with yellow to tan scute centers. The forelimbs are flattened and adapted for digging and burrowing. Optimal habitat has been characterized as creosote bush scrub in which precipitation ranges from 2 to 8 inches, where a diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982; Turner 1982; Turner and Brown 1982). Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. Desert tortoises occur from below sea level to an elevation of 7,300 feet, but the most favorable habitat occurs at elevations of approximately 1,000 to 3,000 feet (Luckenbach 1982). Maximum longevity in the wild is likely to be about 50 to 70 years, the norm being 25 to 35 years (Germano 1992, 1994 in Boarman 2002a).

Tortoise activity patterns are primarily controlled by ambient temperature and precipitation (Nagy and Medica 1986, Zimmerman *et al.* 1994). In the East Mojave and Colorado Deserts, annual precipitation occurs in both summer and winter, providing food and water to tortoises throughout much of the summer and fall. Most precipitation occurs in winter in the West Mojave Desert resulting in an abundance of annual spring vegetation, which dries up by late May or June. Tortoises in the West Mojave are primarily active in May and June, with a secondary activity period from September through October. Tortoises may also be active during periods of mild or rainy weather in summer and winter. During inactive periods, tortoises rest in subterranean burrows or caliche caves, and spend approximately 98 percent of the time in these shelter sites (Nagy and Medica 1986). During active periods, they usually spend nights and the hotter part of the day in their burrow; they may also rest under shrubs or in shallow burrows (pallets). Tortoises may use an average of 7 to 12 burrows at any given time (Barrett 1990, Bulova 1994, TRW Environmental Safety Systems Inc.1997).

Walde *et al* (2003) observed that desert tortoises retreated into burrows when air temperature reached 91.0° F (32.8°C) ± 3.55° F (1.97°C) and ground temperatures reached 94.6° F (34.8°C) ± 6.05° F (3.36°C); 95 percent of desert tortoise observations of desert tortoises above ground occurred at air temperature less than 91° F (33°C). The body temperature at which desert tortoises become incapacitated ranges from 101.5° F (38.6°C) to 113.2° F (45.1°C) (Naegle 1976, Zimmerman *et al.* 1994).

Desert tortoises are most commonly found within the desert scrub vegetation type, primarily in creosote bush scrub. In addition, they occur in succulent scrub, cheesebush scrub, blackbrush scrub, hopsage scrub, shadscale scrub, microphyll woodland, Mojave saltbush-allscale scrub and scrub-steppe vegetation types of the desert and semidesert grassland complex (Service 1994). Within these vegetation types, desert tortoises potentially can survive and reproduce where their basic habitat requirements are met. These requirements include a sufficient amount and quality of forage species; shelter sites for protection from predators and environmental extremes; suitable substrates for burrowing, nesting, and overwintering; various plants for shelter; and adequate area for movement, dispersal, and gene flow. Throughout most of the Mojave Region, tortoises occur most commonly on gently sloping terrain with soils ranging from sandy-gravel and with scattered shrubs, and where there is abundant inter-shrub space for growth of herbaceous plants. Throughout their range, however, tortoises can be found in steeper, rockier areas.

Although desert tortoises eat alien plants, they generally prefer native forbs when available (Jennings 1993, Avery 1998). Consumption of alien plants may place them at a nitrogen and water deficit (Henen 1997). Droughts frequently occur in the desert, resulting in extended periods of low water availability. Periods of extended drought place tortoises at even greater water and nitrogen deficit than during moderate or high rainfall years (Peterson 1996, Henen 1997). During a drought, more nitrogen than normal is required to excrete nitrogenous wastes, thus more rapidly depleting nitrogen stored in body tissues. Plants also play important roles in stabilizing soil and providing cover for protection from predators and heat.

Tortoise activities are concentrated in overlapping core areas, known as home ranges. Because tortoises do not defend a specific, exclusive area, they do not maintain territories. The size of desert tortoise home ranges varies with respect to location and year. Female home ranges are approximately half that of the average male, which range from 25 to 200 acres (Berry 1986). Over its lifetime, each desert tortoise may require more than 1.5 square miles of habitat and make forays of more than 7 miles at a time (Berry 1986). In drought years, the ability of tortoises to drink while surface water is available following rains may be crucial for tortoise survival. During droughts, tortoises forage over larger areas, increasing the likelihood of encounters with sources of injury or mortality including humans and other predators.

Changing ecological condition as a result of natural events or human-caused activities may stress individuals and result in a more severe clinical expression of URTD (Brown *et al.* 2002). For

example, the proliferation of non-native plants within the range of the tortoise has had far-reaching impacts on tortoise populations. Tortoises have been found to prefer native vegetation over non-natives (Tracy *et al.* 2004). Non-native annual plants in desert tortoise critical habitat in the western Mojave Desert were found to compose over 60 percent of the annual biomass (Brooks 1998). The reduction in quantity and quality of forage may stress tortoises and make them more susceptible to drought- and disease-related mortality (Brown *et al.* 1994). Malnutrition has been associated with several disease outbreaks in both humans and turtles (Borysenko and Lewis 1979). What is currently known with certainty about disease in the desert tortoise relates entirely to individual tortoises and not populations; virtually nothing is known about the demographic consequences of disease (Tracy *et al.* 2004).

Further information on the range, biology, and ecology of the desert tortoise can be found in Berry and Burge (1984), Brooks *et al.* 2003, Burge (1978), Burge and Bradley (1976), Bury *et al.* (1994), Germano *et al.* (1994), Hovik and Hardenbrook (1989), Jennings (1997), Karl (1981, 1983a, 1983b), Luckenbach (1982), Service (1994), and Weinstein *et al.* (1987).

a. Desert Tortoise Recovery Plan Assessment and Recommendations

The General Accounting Office (GAO) Report, *Endangered Species: Research Strategy and Long-Term Monitoring Needed for the Mojave Desert Tortoise Recovery Program* (U.S. General Accounting Office 2002), directed the Service to periodically reassess the Recovery Plan to determine whether scientific information developed since its publication could alter implementation actions or allay some of the uncertainties about its recommendations. In response to the GAO report, the Service initiated a review of the existing Recovery Plan in 2003. In March 2003, the Service impaneled the Desert Tortoise Recovery Plan Assessment Committee (Committee) to assess the Recovery Plan. The Committee was selected to represent several important characteristics with particular emphasis on commitment to solid science. The charge to the Committee was to review the entire Recovery Plan in relation to contemporary knowledge to determine which parts of the recovery plan will need updating. The recommendations of the Committee were presented to the Service and Desert Tortoise Management Oversight Group on March 24, 2004. The recommendations will be used as a guide by a recovery team of scientists and stakeholders to modify the 1994 Recovery Plan. A revised recovery plan is anticipated by the end of 2006.

The Committee recognized that the distribution and abundance data indicate trends leading away from recovery goals in some parts of the species' range. These results indicate a need for more aggressive efforts to facilitate recovery. Many of the original prescriptions of the Recovery Plan were never implemented although these prescriptions continue to be appropriate. New prescriptions should be prioritized to assess redundancies and synergies within individual threats.

b. Recovery Units

The Northeastern Mojave Recovery Unit occurs primarily in Nevada, but it also extends into California along the Ivanpah Valley and into extreme southwestern Utah and northwestern Arizona. Vegetation within this unit is characterized by creosote bush scrub, big galleta-scrub steppe, desert needlegrass scrub-steppe, and blackbrush scrub (in higher elevations). Topography is varied, with flats, valleys, alluvial fans, washes, and rocky slopes. Much of the northern portion of the Northeastern Mojave Recovery Unit is characterized as basin and range, with elevations from 2,500 to 12,000 feet. Desert tortoises typically eat summer and winter annuals, cacti, and perennial grasses. Desert tortoises in this recovery unit, the northern portion of which represents the northernmost distribution of the species, are typically found in low densities (about 10 to 20 adults per square mile).

A kernel analysis was conducted in 2003-2004 for the desert tortoise (Tracy *et al.* 2004) as part of the reassessment of the 1994 Recovery Plan. The kernel analyses revealed several areas in which the kernel estimations for live tortoises and carcasses did not overlap. The pattern of non-overlapping kernels that is of greatest concern is those in which there were large areas where the kernels encompassed carcasses but not live animals. These regions represent areas within DWMAs where there were likely recent die-offs or declines in tortoise populations. The kernel analysis indicated large areas in the Piute-Eldorado Valley where there were carcasses but no live tortoises. For this entire area in 2001, there were 103 miles of transects walked, and a total of 6 live and 15 dead tortoises were found, resulting in a live encounter rate of 0.06 tortoises per mile of transect for this area. This encounter rate was among the lowest that year for any of the areas sampled in the range of the Mojave desert tortoise (Tracy *et al.* 2004).

Kernel analysis for the Coyote Springs DWMA showed areas where the distributions of carcasses and living tortoises do not overlap; however, densities of adult tortoises for the region do not show a statistical trend over time. Thus, while there may be a local die-off occurring in the northern portion of this DWMA, this does not appear to influence the overall trend in the region as interpreted by study plot data. Because permanent study plots for this region were discontinued after 1996, if there have been recent declines in numbers they are not reflected in the kernel analysis. Nevertheless, large regions of non-overlapping carcass and live tortoise kernels in the regions were not identified adjacent to the Coyote Springs DWMA. The probability of finding either a live tortoise or a carcass was relatively very low for Beaver Dam Slope and Gold-Butte Pakoon, and moderately low for Mormon Mesa/Coyote Springs.

The Eastern Mojave Recovery Unit is situated primarily in California, but also extends into Nevada in the Amargosa, Pahrump, and Piute valleys. In the Eastern Mojave Recovery Unit, desert tortoises are often active in late summer and early autumn in addition to spring because this region receives both winter and summer rains and supports two distinct annual floras on which they can feed. Desert tortoises in the Eastern Mojave Recovery Unit occupy a variety of vegetation types and feed on summer and winter annuals, cacti, perennial grasses, and

herbaceous perennials. They den singly in caliche caves, bajadas, and washes. This recovery unit is isolated from the Western Mojave Recovery Unit by the Baker Sink, a low-elevation, extremely hot and arid strip that extends from Death Valley to Bristol Dry Lake. The Baker Sink area is generally not considered suitable for desert tortoises. Desert tortoise densities in the Eastern Mojave Recovery Unit can vary dramatically, ranging from 5 to as much as 350 adults per square mile (Service 1994).

Ivanpah and Piute-Eldorado valleys contained study plots that were analyzed in the Eastern Mojave Recovery Unit analysis. While there was no overall statistical trend in adult density over time, the 2000 survey at Goffs and the 2002 survey at Shadow Valley indicate low densities of adult tortoises relative to earlier years. Unfortunately, there are no data in the latter years for all five study plots within this recovery unit, and therefore, while there is no statistical trend in adult densities, we cannot conclude that tortoises have not experienced recent declines in this area. The probability of finding a carcass on a distance sampling transect was considerably higher for Ivanpah, Chemehuevi, Fenner, and Piute-Eldorado, which make up the Eastern Mojave Recovery Unit.

The Northern Colorado Recovery Unit is located completely in California. Here desert tortoises are found in the valleys, on bajadas and desert pavements, and to a lesser extent in the broad, well-developed washes. They feed on both summer and winter annuals and den singly in burrows under shrubs, in intershrub spaces, and rarely in washes. The climate is somewhat warmer than in other recovery units, with only 2 to 12 freezing days per year. The tortoises have the California mitochondrial DNA (mtDNA) haplotype and phenotype. Allozyme frequencies differ significantly between this recovery unit and the Western Mojave, indicating some degree of reproductive isolation between the two.

Desert tortoises in the Eastern Colorado Recovery Unit, also located completely in California, occupy well-developed washes, desert pavements, piedmonts, and rocky slopes characterized by relatively species-rich succulent scrub, creosote bush scrub, and Blue Palo Verde-Ironwood-Smoke Tree communities. Winter burrows are generally shorter in length, and activity periods are longer than elsewhere due to mild winters and substantial summer precipitation. The tortoises feed on summer and winter annuals and some cacti; they den singly. They also have the California mtDNA haplotype and shell type.

The Upper Virgin River Recovery Unit encompasses all desert tortoise habitat in Washington County, Utah, except the Beaver Dam Slope, Utah population. The desert tortoise population in the area of St. George, Utah is at the extreme northeastern edge of the species' range and experiences long, cold winters (about 100 freezing days) and mild summers, during which the tortoises are continually active. Here the animals live in a complex topography consisting of canyons, mesas, sand dunes, and sandstone outcrops where the vegetation is a transitional mixture of sagebrush scrub, creosote bush scrub, blackbush scrub, and a psammophytic community. Desert tortoises use sandstone and lava caves instead of burrows, travel to sand

dunes for egg-laying, and use still other habitats for foraging. Two or more desert tortoises often use the same burrow. Shell morphology and mtDNA have not been studied in this recovery unit, but allozyme variation is similar to that found in the Northeastern Mojave Recovery Unit.

The Western Mojave Recovery Unit occurs completely in California and is exceptionally heterogeneous and large. It is composed of the Western Mojave, Southern Mojave, and Central Mojave regions, each of which has distinct climatic and vegetational characteristics. The most pronounced difference between the Western Mojave and other recovery units is in timing of rainfall and the resulting vegetation. Most rainfall occurs in fall and winter and produces winter annuals, which are the primary food source of tortoises. Above ground activity occurs primarily in spring, associated with winter annual production. Thus, tortoises are adapted to a regime of winter rains and rare summer storms. Here, desert tortoises occur primarily in valleys, on alluvial fans, bajadas, and rolling hills in saltbrush, creosote bush, and scrub steppe communities. Tortoises dig deep burrows (usually located under shrubs on bajadas) for winter hibernation and summer aestivation. These desert tortoises generally den singly. They have a California mtDNA haplotype and a California shell type.

c. Populations

Distribution: The prescriptions for recovery in the Recovery Plan were for individual populations and assumed that preserving large blocks of habitat and managing threats in that habitat would be principally all that would be necessary to recover the species. However, that original paradigm, and the prescriptions made within that paradigm, may be wrong. Existing data have revealed population crashes that have occurred asynchronously across the range. There are reports that some populations, which have crashed previously, have subsequently increased in population density. Additionally, all known dense populations of desert tortoises have crashed. This suggests that density-dependent mortality occurs in desert tortoise populations, and that population dynamics may be asynchronous.

These characteristics indicate that tortoises may exist in a classic metapopulation structure (Hanski 1999; Levins and Culver 1971; Levin *et al.* 1984), and this should portend profoundly different prescriptions for recovery. In particular, if desert tortoises have historically existed in metapopulations, then connections among habitat patches are a necessary part of conservation prescriptions. Additionally, habitat suitable for tortoises, but without tortoises, should be regarded as equally necessary for recovery. Long-term persistence cannot be determined from tortoise density or tortoise numbers alone, but assessment must include the complexities of metapopulation dynamics and the habitat characteristics that promote metapopulation dynamics including habitat connectivity through inefficient corridors (*i.e.*, partial connectivity), asynchrony of subpopulation dynamics, and several separate habitat patches. Some of the characteristics of proper metapopulation function may already have been obviated by proliferation of highways, and habitat fragmentation due to satellite urbanization. Thus, management may require artificially facilitating metapopulation processes such as movement among patches.

The genetic distinctness of tortoise populations and their pathogens should be assessed to guide all manipulative management actions (*e.g.*, head starting, translocation, habitat restoration, and corridor management). The Committee proposed a revision to the previous delineation of recovery units, or Distinct Population Segments (DPSs) based on new scientific information. The recommended delineations reflect the prevailing concepts of subpopulation "discreteness," and "significance," and incorporate morphological, behavioral, genetic, and environmental information. The Committee's recommendation reduces the number of DPSs from six to five by leaving the original Upper Virgin River and Western Mojave units intact and recombining the four central units into three reconfigured units: Lower Virgin River Desert, Northeastern Mojave Desert (including Amargosa Valley, Ivanpah Valley, and Shadow Valley), and Eastern Mojave and Colorado Desert. These recommended DPSs are based largely on the best resolving biochemical/genetic data of Rainboth *et al.* (1989), Lamb *et al.* (1989), Lamb and Lydehard (1994), and Britten *et al.* (1997). Because these delineations are general and not definitive at this time, more data and analyses are required which may result in additional modification. Although DPSs have been proposed by the Committee, no DPSs have been officially designated by the Service.

The 1994 Recovery Plan conceived desert tortoises to be distributed in large populations that required large areas and large densities to recover. However, existing data are consistent with the possibility that tortoises have evolved to exist in *metapopulations*. Metapopulation theory conceives that tortoises are distributed in metapopulation patches connected with corridors that allow inefficient and asynchronous movements of individuals among the patches. This paradigm conceives that some habitat patches within the range of the desert tortoise will have low population numbers or no tortoises at all, and others will have higher population numbers. Movement among the patches is necessary for persistence of the "system." If desert tortoises evolved to exist in metapopulations, then long-term persistence requires addressing habitat fragmentation caused by highways and satellite urbanization. Ensuring the integrity and function of natural corridors among habitat patches might require active management of tortoise densities in habitat patches and associated corridors.

Land managers and field scientists identified 116 species of alien plants in the Mojave and Colorado Deserts (Brooks and Esque 2002). The proliferation of non-native plant species has also contributed to an increase in fire frequency in tortoise habitat by providing sufficient fuel to carry fires, especially in the intershrub spaces that are mostly devoid of native vegetation (Service 1994; Brooks 1998; Brown and Minnich 1986). Changes in plant communities caused by alien plants and recurrent fire may negatively affect the desert tortoise by altering habitat structure and species composition of their food plants (Brooks and Esque 2002).

Numerous wildfires occurred in desert tortoise habitat across the range of the desert tortoise in 2005 due to abundant fuel from the proliferation of non-native plant species after a very wet winter. These wildfires heavily impacted two of the six desert tortoise recovery units, burning less than 19 percent of desert tortoise habitat in the Upper Virgin River and 10 percent in the

Northeastern Mojave (Table 1). In the Upper Virgin River Recovery Unit, 19 percent of the Upper Virgin River critical habitat unit (CHU) burned. In the Northeastern Mojave Recovery Unit, three CHUs were impacted: about 23 percent of the Beaver Dam Slope CHU burned, 13 percent of the Gold Butte-Pakoon CHU, and 4 percent of the Mormon Mesa CHU. Although it is known that tortoises were burned and killed by the wildfires, tortoise mortality estimates are not available at this time. Wildfires did not occur within the Sloan Canyon NCA in 2005.

Table 1. Acres of desert tortoise habitat burned in each recovery unit during 2005. Note all data is preliminary and needs further analysis.

Recovery Unit	Habitat Burned (acres)	Percent Habitat Burned	CH* Burned (acres)	Percent CH Burned
Upper Virgin River**	10,446	< 19	10,446	19
Northeastern Mojave***	500,000	10	124,782	11
Eastern Mojave	6,000	< 1	1,219	<1
Western Mojave	0	0	0	0
Northern Colorado	0	0	0	0
Eastern Colorado	0	0	0	0
Total	**516,446**	-	**136,447**	-

* CH – critical habitat
** Estimates only for Upper Virgin River; needs GIS analysis.
*** Potential habitat was mapped and calculated as Mojave Desert less than 4,200 feet in elevation minus playas, open water, and developed and agricultural lands.

Disease was identified in the 1994 Recovery Plan as an important threat to the desert tortoise. Disease is a natural phenomenon in wild populations of animals and can contribute to population declines by increasing mortality and reducing reproduction. However, URTD appears to be a complex, multi-factorial disease interacting with other stressors to affect desert tortoises (Brown *et al.* 2002; Tracy *et al.* 2004). The disease occurs mostly in relatively dense desert tortoise populations, as mycoplasmal infections are dependent upon higher densities of the host (Tracy *et al.* 2004).

Reproduction: Desert tortoises possess a combination of life history and reproductive characteristics that affect the ability of populations to survive external threats. Tortoises grow slowly, require 15 to 20 years to reach sexual maturity, and have low reproductive rates during a long period of reproductive potential (Turner *et al.* 1984; Bury 1987; Tracy *et al.* 2004).

Choice of mate is mediated by aggressive male-male interactions and possibly by female choice (Niblick *et al.* 1994). Tortoises in the West Mojave Desert may exhibit pre-breeding dispersal movements, typical of other vertebrates, ranging from 1 to 10 miles in a single season (Sazaki *et al.* 1995). The advantage of pre-breeding dispersal may be to find a more favorable environment

in which to reproduce. However, the risk is increased mortality from predation, exposure, starvation, or anthropogenic factors (*e.g.*, motor vehicle mortality).

The average clutch size is 4.5 eggs (range 1 to 8), with 0-3 clutches deposited per year (Turner *et al.* 1986). Clutch size and number probably depend on female size, water, and annual productivity of forage plants in the current and previous year (Turner *et a*l. 1984, 1986; Henen 1997). The ability to alter reproductive output in response to resource availability may allow individuals more options to ensure higher lifetime reproductive success. The interaction of longevity, late maturation, and relatively low annual reproductive output causes tortoise populations to recover slowly from natural or anthropogenic decreases in density. To ensure population stability or increase, these factors also require relatively high juvenile survivorship (75 to 98 percent per year), particularly when adult mortality is elevated (Congdon *et a*l. 1993). Most eggs are laid in spring (April through June) and occasionally in fall (September to October). Eggs are laid in sandy or friable soil, often at the entrance to burrows. Hatching occurs 90 to 120 days later, mostly in late summer and fall (mid-August to October). Eggs and young are untended by the parents.

Tortoise sex determination is environmentally controlled during incubation (Spotila *et al.* 1994). Hatchlings develop into females when the incubation (*i.e.*, soil) temperature is greater than 88.7° F (31.5° C) and males when the temperature is below that (Lance 2006). Mortality is higher when incubation temperatures are greater than 95.5° F (35.3° C) or less than 78.8° F (26.0° C). The sensitivity of embryonic tortoises to incubation temperature may make populations vulnerable to unusual changes in soil temperature (*e.g.*, from changes in vegetation cover).

At Yucca Mountain, Nye County Nevada (Northeastern Mojave Recovery Unit), Mueller *et al.* (1998) estimated that the mean age of first reproduction was 19 to 20 years; clutch size (1 to 10 eggs) and annual fecundity (0 to 16 eggs) were related to female size but annual clutch frequency (0 to 2) was not. Further, Mueller suggested that body condition during July to October may determine the number of eggs a tortoise can produce the following spring. McLuckie and Friedell (2002) determined that the Beaver Dam Slope desert tortoise population, within the Northeastern Mojave Recovery Unit, had a lower clutch frequency (1.33 ± 0.14) per reproductive female and fewer reproductive females (14 out of 21) when compared with other Mojave desert tortoise populations. In the 1990's, Beaver Dam Slope experienced dramatic population declines due primarily to disease and habitat degradation and alteration (Service 1994). The number of eggs that a female desert tortoise can produce in a season is dependent on a variety of factors including environment, habitat, availability of forage and drinking water, and physiological condition (Henen 1997; McLuckie and Fridell 2002).

Numbers: Data collected on 1-square-mile permanent study plots indicate that tortoise populations have declined both in numbers of tortoises found during surveys and in densities of live tortoises at most sites since the plots were first established 20-30 years ago (Berry *et al.*

2002). Declines of 50 to 96 percent have occurred regardless of initial tortoise densities. Increases in the occurrence of shell-skeletal remains have been found to correspond with declines in numbers and densities of live tortoises with the exception of certain plots where poaching has been documented (Berry 2003).

Results of desert tortoise surveys at three survey plots in Arizona indicate that all three sites have experienced significant die-offs. Six live tortoises were located in a 2001 survey of the Beaver Dam Slope Exclosure Plot (Walker and Woodman 2002). Three had definitive signs of URTD, and two of those also had lesions indicative of cutaneous dyskeratosis. Previous surveys of this plot detected 31 live tortoises in 1996, 20 live tortoises in 1989, and 19 live tortoises in 1980. The 2001 survey report indicated that it is likely that there is no longer a reproductively viable population of tortoises on this study plot. Thirty-seven live tortoises were located in a 2002 survey of the Littlefield Plot (Young *et al.* 2002). None had definitive signs of URTD. Twenty-three tortoises had lesions indicative of cutaneous dyskeratosis. Previous surveys of this plot detected 80 live tortoises in 1998 and 46 live tortoises in 1993. The survey report indicated that the site might be in the middle of a die-off due to the high number of carcasses found since the site was last surveyed in 1998. Nine live tortoises were located during the mark phase of a 2003 survey of the Virgin Slope Plot (Goodlett and Woodman 2003). The surveyors determined that the confidence intervals of the population estimate would be excessively wide and not lead to an accurate population estimate, so the recapture phase was not conducted. One tortoise had definitive signs of URTD. Seven tortoises had lesions indicative of cutaneous dyskeratosis. Previous surveys of this plot detected 41 live tortoises in 1997 and 15 live tortoises in 1992. The survey report indicated that the site may be at the end of a die-off that began around 1996-1997.

The Western Mojave has experienced marked population declines as indicated in the Recovery Plan and continues today. Spatial analyses of the Western Mojave show areas with increased probabilities of encountering dead rather than live animals, areas where kernel estimates for carcasses exist in the absence of live animals, and extensive regions where there are clusters of carcasses where there are no clusters of live animals. Collectively, these analyses point generally toward the same areas within the Western Mojave, namely the northern portion of the Fremont-Kramer DWMA and the northwestern part of the Superior-Cronese DWMA. Together, these independent analyses, based on different combinations of data, all suggest the same conclusion for the Western Mojave. Data are not currently available with sufficient detail for most of the range of the desert tortoise with the exception of the Western Mojave (Tracy *et al.* 2004).

Declines in tortoise abundance appear to correspond with increased incidence of disease in tortoise populations. The Goffs permanent study plot in Ivanpah Valley, California, suffered 92 to 96 percent decreases in tortoise density between 1994 and 2000 (Berry 2003). The high prevalence of disease in Goffs tortoises likely contributed to this decline (Christopher *et al.* 2003). Upper respiratory tract disease has not yet been detected at permanent study plots in the Sonoran Desert of California, but is prevalent at study plots across the rest of the species' range (Berry 2003) and has been shown to be a contributing factor in population declines in the western

Mojave Desert (Brown *et al.* 2002; Christopher *et al.* 2003). High mortality rates at permanent study plots in the northeastern and eastern Mojave and Sonoran Deserts appear to be associated with incidence of shell diseases in tortoises (Jacobson *et al.* 1994). Low levels of shell diseases were detected in many populations when the plots were first established, but were found to increase during the 1980s and 1990s (Jacobson *et al.* 1994; Christopher *et al.* 2003). A herpesvirus has recently been discovered in desert tortoises, but little is known about its effects on tortoise populations at this time (Berry *et al.* 2002; Origgi *et al.* 2002).

The kernel analysis of the Eastern Colorado Recovery Unit shows that the distributions of the living tortoises and carcasses overlap for most of the region. The Chuckwalla Bench study plot occurs outside the study area, which creates a problem in evaluating what may be occurring in that area of the recovery unit. However, the few transects walked in that portion of the DWMA yielded no observations of live or dead tortoises. This illustrates our concern for drawing conclusions from areas represented by too few study plots and leaves us with guarded concern for this region. The percentage of transects with live animals was relatively high for most DWMAs within the Eastern Colorado Recovery Unit. In addition, the ratio of carcasses to live animals was low within this recovery unit relative to others.

There are many natural causes of mortality, but their extents are difficult to evaluate and vary from location to location. Native predators known to prey on tortoise eggs, hatchlings, juveniles, and adults include: coyote, kit fox, badger (*Taxidea taxus*), skunks (*Spilogale putorius*), common ravens, golden eagles (*Aquila chrysaetos*), and Gila monsters (*Heloderma suspectum*). Additional natural sources of mortality to eggs, juvenile, and adults may include desiccation, starvation, being crushed (including in burrows), internal parasites, disease, and being turned over onto their backs during fights or courtship (Luckenbach 1982, Turner *et al.* 1987). Free-roaming dogs cause mortality, injury, and harassment of desert tortoises (Evans 2001). Population models indicate that for a stable population to maintain its stability, on average, no more than 25 percent of the juveniles and 2 percent of the adults can die each year (Congdon *et al.* 1993, Service 1994). However, adult mortality at one site in the West Mojave was 90 percent over a 13-year period (Berry 1997). Morafka *et al.* (1997) reported 32 percent mortality over five years among free-ranging and semi-captive hatchling and juvenile tortoises (up to five years old) in the West Mojave. When the 26 that were known to have been preyed on by ravens were removed from the analysis, mortality dropped to 24 percent. Turner *et al.* (1987) reported an average annual mortality rate of 19 to 22 percent among juveniles over a nine-year period in the East Mojave.

The status and trends of desert tortoise populations are difficult to determine based only upon assessment of tortoise density due largely to their overall low abundance, subterranean sheltering behavior, and cryptic nature of the species. Thus, monitoring and recovery should include a comprehensive assessment of the status and trends of threats and habitats as well as population distribution and abundance.

For more information on desert tortoise or expanded discussions on recovery units and recommended DPSs, please refer to the Recovery Plan (Service 1994) and report prepared by the Committee (Tracy *et al.* 2004).

d. Critical Habitat - Rangewide

On February 8, 1994, the Service designated approximately 6.45 million acres of critical habitat for the Mojave population of the desert tortoise in portions of California (4.75 million acres), Nevada (1.22 million acres), Arizona (339 thousand acres), and Utah (129 thousand acres) (59 FR 5820-5846, also see corrections in 59 FR 9032-9036), which became effective on March 10, 1994. Desert tortoise critical habitat was designated by the Service to identify the key biological and physical needs of the desert tortoise and key areas for recovery, and focuses conservation actions on those areas. Desert tortoise critical habitat is composed of specific geographic areas that contain the primary constituent elements of critical habitat, consisting of the biological and physical attributes essential to the species' conservation within those areas, such as space, food, water, nutrition, cover, shelter, reproductive sites, and special habitats. The specific primary constituent elements of desert tortoise critical habitat are: sufficient space to support viable populations within each of the six recovery units, and to provide for movement, dispersal, and gene flow; sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality.

Critical habitat units were based on recommendations for DWMAs outlined in the *Draft Recovery Plan for the Desert Tortoise (Mojave Population)* (Service 1993). These DWMAs are also identified as "desert tortoise ACECs" by BLM. Because the critical habitat boundaries were drawn to optimize reserve design, the critical habitat unit may contain both "suitable" and "unsuitable" habitat. Suitable habitat can be generally defined as areas that provide the primary constituent elements.

III. Environmental Baseline

a. Status of the Species and its Habitat in the Action Area

The North McCullough Wilderness consists of the Mojave Desert scrub vegetative community. This community is primarily composed of low, widely spaced shrubs, including creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). Other affiliated community shrubs include ephedra (*Ephedra* spp.); brittlebush (*Encelia virginensis*); burro bush (*Hymenoclea salsola*); sweetbush, or bebbia (*Bebbia juncea*); and desert saltbush (*Atriplex polycarpa*). Characteristic species associated with the Mojave Desert include Mojave yucca (*Yucca schidigera*), teddybear cholla (*Opuntia bigelovii*), and hedgehog cacti (*Echinoceres* spp.). Short-

lived annual and perennial wild flowers appear in late March, April, and May, and when prompted by winter rains. Four vegetation associations are represented within the Sloan Canyon NCA which include: volcanic basalt slope, moderate creosote (greater than 30 percent cover), sparse creosote/bursage mix, and desert wash. For the estimation of desert tortoise habitat in the NCA, 4,000 feet is considered as the upper elevation for desert tortoise occurrence. Thus, approximately 44,710 of the 48,438 acres of the NCA contain potential tortoise habitat.

Because this consultation is programmatic in scope, desert tortoise surveys were not conducted specifically to provide information on the desert tortoise in the Sloan Canyon NCA. The status of the desert tortoise population in the action area is based on existing data including surveys in the Piute Valley and Las Vegas Valley. These data include triangle transects at random locations within suitable tortoise habitat conducted by BLM between the mid-1980s and 1990. These transects consist of walking the perimeter of an equilateral triangle, 0.5-mile on each side, while recording observations of desert tortoise sign in an area approximately 30 feet wide, providing approximately 6 acres of 100-percent coverage. Triangles were aligned such that each transect represented homogenous habitat to the extent possible. Potential desert tortoise habitat targeted in the surveys includes all acres associated with the creosote-bursage, Mojave mixed scrub, grassland, and blackbrush vegetation communities. Average total adjusted sign (TAS) is determined and relative desert tortoise density is calculated based on the formula developed by Berry and Nicholson (1984). TAS, where total sign is corrected to account for multiple sign that could be attributed to a single tortoise, was then correlated using a regression model to estimate abundance of tortoises per square mile and categorized by relative density.

There are 41,484 acres of tortoise habitat within the BLM/Las Vegas disposal boundary which were identified during desert tortoise surveys conducted from September 2003 through April 2004 (BLM 2004). These tortoise surveys indicate very low to low population densities near the western and northern boundaries of the NCA. Desert tortoise data from Hidden Valley and Eldorado/Piute Valley to the west and south of the NCA indicate low to moderate tortoise population densities. The better tortoise habitat in the NCA includes rolling uplands near washes and adjacent bajadas at the lower elevations on the northern border of the NCA. There is little doubt that the higher elevations of the NCA support very low tortoise population densities, at best.

Nevada Power's Magnolia Substation was constructed northwest of the NCA in 2005. Surveys and monitoring activities in support of this project yielded 20 live tortoises. Surveys for Nevada Power's project and other projects over the years indicate a low to moderate population density in better tortoise habitat.

BLM estimates that the overall relative tortoise density for the Sloan Canyon NCA is low (10-45 tortoises per square mile) based on the data identified above. BLM triangle transect data indicate that the relative desert tortoise population density is low in the areas adjacent to what was to become the Sloan Canyon NCA.

Overview of the Northeastern Mojave Recovery Unit: The action area occurs entirely within the Northeastern Mojave Recovery Unit. The Northeastern Mojave Recovery Unit occurs primarily in Nevada, but it also extends into California along the Ivanpah Valley and into extreme southwestern Utah and northwestern Arizona. Within this recovery unit, the Recovery Plan recommended designation of the following ACECs/DWMAs: Piute-Eldorado; Beaver Dam Slope; Gold Butte-Pakoon; Mormon Mesa; Coyote Spring; and Ivanpah. BLM's Las Vegas Field Office designated portions of the Piute-Eldorado, Mormon Mesa, and Gold Butte-Pakoon ACECs, and all of the Coyote Spring ACEC. BLM's Ely Field Office designated portions of the Mormon Mesa and Beaver Dam Slope ACECs, and all of the Kane Springs ACEC in the Caliente MFP Amendment (BLM 2000b). BLM's Dixie and Arizona Strip Field Offices designated the remaining portions of the Beaver Dam Slope ACEC and all of the Virgin Slope ACEC in their RMPs. In total, approximately 1.8 million acres of tortoise habitat has been designated as desert tortoise ACEC/DWMA in the Northeastern Mojave Recovery Unit.

Vegetation within this recovery unit is characterized by creosote bush scrub, big galleta-scrub steppe, desert needlegrass scrub-steppe, and blackbrush scrub (in higher elevations). Topography is varied, with flats, valleys, alluvial fans, washes, and rocky slopes. Much of the northern portion of the Northeastern Mojave Recovery Unit is characterized as basin and range, with elevations from 2,500 to 12,000 feet. Desert tortoises typically eat summer and winter annuals, cacti, and perennial grasses. Desert tortoises in this recovery unit, which represent the northernmost distribution of the species, are typically found in low densities (approximately 10 to 20 adults per square mile).

b. Factors affecting the species environment in the action area.

Visitor use of the action area was low prior to the Sloan Canyon NCA and North McCullough Wilderness designations; however, recreation is increasing along the urban interface. Generally, the NCA has few roads, routes, trails, or facilities to support recreation. Approximately 100 miles of disturbance from roads, OHV trails, and foot paths have been identified in the NCA. There are no special recreation permits issued or under review within the NCA. Hiking and OHV use are the major recreational activities in the area. Prior to NCA designation, the Las Vegas RMP (BLM 1998) guided management of recreation activities in the action area. Administrative actions taken under the Las Vegas RMP closed approximately the northern half of the NCA to shooting, camping, and OHV use.

BLM identified 44 valid existing rights-of-way on file when the NCA was designated. There are also several pending applications that were filed before the designation, and they would be processed to completion. The rights-of-way are primarily for power lines, flood control facilities, access roads, and communication sites, and are confined primarily to the northern and eastern portions of the NCA. The Nevada Power Company holds the majority of the rights-of-way, which are for power lines and supporting infrastructure. The City of Henderson is the second-largest holder of rights-of-way which are mainly for flood control (two detention and two debris

basins), and two roads and two trails; the rights-of-way for the existing road is to access a flood-control facility, and two new trail rights-of-way for the location of the North McCullough Road and Trail were granted as part of the Sloan Canyon NCA Act.

Telecommunication companies and Federal, State, local, and private agencies hold the remaining rights-of-way. Three communication sites are located within the NCA: Black Mountain Upper, Black Mountain 2, and Black Mountain 3. Each communication site contains multiple rights-of-way and/or leases for individual communication facilities.

BLM monitored visitor use at several sites in the Sloan Canyon NCA from November 2003 to July 2004. During this observation period, approximately 4,000 visitors were counted within the NCA which averages 15 visitors per day or extrapolated to 5,500 visitors per year. BLM estimates that actual visitation is five times higher than the number observed. Thus, current visitation is estimated to be 28,000 visitors per year.

The majority of the OHV use within the action area occurs in the northeastern section of the NCA. A network of routes and trails in the basin in the far northeastern section has been used heavily by motorcycles, OHVs, and four-wheel drive vehicles. Large portions of this area have been damaged from braided routes, steep grades, and pioneering of new routes. BLM does not maintain any routes in the area; however, Nevada Power provides limited maintenance for two power line roads. Boarman (2002b) established that OHV use reduces tortoise densities; however, no studies were found that test how much habitat loss to OHV use can be sustained by the species, or whether limited use is less destructive than open use to desert tortoise habitat, which makes it difficult to extrapolate results to a population level. Relatively easy access into this area has resulted in widespread recreational shooting and trash dumping. BLM has conducted numerous clean-up projects in the area (Gerald Hickman, wildlife biologist, BLM, pers. comm.). In contrast, BLM estimates recreation use in the southeastern section of the NCA to be low due to rugged terrain and very limited access.

The North McCullough Wilderness encompasses the Sloan Canyon Petroglyph Site which is the major point of interest in the area. Other areas in the Wilderness receive low levels of visitor use because of its rugged terrain and prohibition of vehicles. Public use of the Wilderness consists mostly of hiking, equestrian use, wildlife viewing (*e.g.,* bighorn sheep), hunting, and dispersed camping. Most disturbances in the Wilderness consist of two-track routes, abandoned mining sites, and wildlife water developments.

The impacts to desert tortoise within the Northeastern Mojave Recovery Unit identified in the Recovery Plan include: Livestock grazing; mining; urban and agricultural development; OHV activity; military activities; roads; disease; rights-of-way and utility corridors; poaching and predation; vandalism; and wildfires. Of these threats to the recovery unit, development, OHV activity (unauthorized), roads and associated vehicle use, rights-of-way, poaching and predation, vandalism, and wildfire potentially affect desert tortoises in the action area. The major urban

area in the Northeastern Mojave Recovery Unit is the Las Vegas Valley which may result in indirect effects to desert tortoises in the NCA.

During implementation of projects authorized under section 7 that occur in desert tortoise habitat, the Service believes tortoises are taken unknowingly during project activities (*e.g.*, buried by earth-moving equipment) and thus, not reported. Although the actual number of tortoises killed, injured, or harassed cannot be determined with a high degree of accuracy and must be estimated, the number of tortoises authorized to be taken in the incidental take statement of a biological opinion is likely to be substantially greater than those actually taken for most projects. The Service believes that implementation of minimization measures, and terms and conditions of biological opinions, result in a substantial reduction in the number of tortoises actually taken.

Summary of Desert Tortoise Take Exempted in the Action Area: Several previous programmatic biological opinions were issued to BLM prior to designation of the Sloan Canyon NCA and involve action areas that overlap the NCA. Additionally, the Service issued incidental take permits for the desert tortoise in association with habitat conservation plans (HCP) that included minimization and mitigation measures for lands within the NCA.

- *Desert Conservation Plan (DCP).* On July 11, 1995, the Service issued an incidental take permit (PRT-801045) to Clark County, Nevada, including cities within Clark County and Nevada Department of Transportation (NDOT), under the authority of section 10(a)(1)(B) of the Act. The permit became effective August 1, 1995, and exempted the "incidental take" of desert tortoises on non-Federal lands for a period of 30 years on 111,000 acres of non-Federal land in Clark County and approximately 2,900 acres associated with NDOT activities in Clark, Lincoln, Esmeralda, Mineral, and Nye counties, Nevada. The DCP served as the permittee's HCP, which included measures to minimize, avoid, and mitigate the effects of covered activities, on desert tortoises (Regional Environmental Consultants 1995). Take of desert tortoise on private lands adjacent to the boundary of the Sloan Canyon NCA was exempted under the DCP from August 1, 1995, until replaced by the Multiple Species HCP in 2000.

- *Multiple Species HCP.* On November 22, 2000, the Service issued an incidental take permit (TE-034927-0) to Clark County, including cities within the county and the NDOT, for the listed desert tortoise, southwestern willow flycatcher (*Empidonax traillii extimus*), and 76 unlisted, un-proposed species (Regional Environmental Consultants 2000). The Multiple Species HCP and permit superseded the DCP and its associated incidental take permit, and provided coverage for the same areas as the DCP. Many measures and commitments established in the DCP were carried forward and incorporated into the Multiple Species HCP. In the intra-Service biological/conference opinion (File No. 1-5-00-FW-575) for approval of the Multiple Species HCP and issuance of an incidental take permit, the Service determined that covered actions would not jeopardize the continued existence of any of the covered species.

Under the special permit terms and conditions of the permit, take of avian species, with the exception of American peregrine falcon (*Falco peregrinus anatum)* and phainopepla (*Phainopepla nitens*), would not be authorized until conservation actions in desert riparian habitats along the Muddy and Virgin rivers, and Meadow Valley Wash have occurred. The incidental take permit allows incidental take of covered species for a period of 30 years on 145,000 acres of non-Federal land in Clark County, and within NDOT rights-of-way, south of the 38th parallel in Nevada. The Multiple Species HCP serves as the permitees' HCP, and details their proposed measures to minimize, monitor, and mitigate the effects of covered activities on the 78 species, which includes the desert tortoise. In addition to measures specified in the Multiple Species HCP and its implementing agreement, the permittees shall comply with the special terms and conditions of the permit and measures stated in sections 3C and 3D of the 1995 DCP, which were incorporated by reference into the Multiple Species HCP and incidental take permit.

The permittees will impose, and NDOT will pay, a fee of $550 per acre of habitat disturbance to fund these measures. The permittees propose to expend $4.1 million per biennium, as adjusted to reflect cost of living increases, to minimize and mitigate the impacts to covered species. It is anticipated that the majority of these funds will be used to implement minimization measures, such as increased law enforcement; construction of highway barriers; road designation, signing, closure, and rehabilitation; and tortoise inventory and monitoring. The benefit to the covered species, as provided by the Multiple Species HCP, should substantially minimize and mitigate those effects which will occur through development within the permit area, and aid in recovery of listed species and conservation of unlisted species. Take of desert tortoise on private lands within, and adjacent to, the boundary of the Sloan Canyon NCA may occur under purview of the Multiple Species HCP. Tortoises within the Sloan Canyon NCA may benefit from conservation actions implanted as mitigation under the Multiple Species HCP.

- *File Nos. 1-5-96-F-023R & 1-5-96-F-23R.2, and 1-5-96-F-023R.3, as amended.* On April 11, 1996, the Service issued a programmatic biological opinion (File No. 1-5-96-F-023R) to BLM's Las Vegas District for implementation of their Management Framework Plan and the land exchange portion of their Stateline RMP within the Las Vegas Valley. Implementation of these plans may result in disposal or development of approximately 125,000 acres of land administered by BLM by sale, land exchange, or lease within the 378,978-acre programmatic area. As a result of urban expansion, most BLM lands within the Las Vegas Valley are highly fragmented and impacted by human activities, particularly a 4,000-acre "exclusionary" zone, which consists primarily of severely degraded or impacted desert tortoise habitat. Except for lands within the exclusionary zone, BLM collects a remuneration fee of $705 per acre, as indexed for inflation, to compensate for the loss of tortoise habitat within the programmatic boundary. The fees

are used to fund management actions that are expected to provide direct and indirect benefits to the desert tortoise over time, which will assist in its recovery.

On April 20, 2001, BLM requested a second reinitiation of consultation on the Las Vegas Valley Biological Opinion. The purpose for modifying the 1996 Biological Opinion was to (1) extend the term of the programmatic biological opinion which expired April 11, 2001, to an indefinite period of time, (2) incorporate the previous correction and amendments into this modified opinion, (3) eliminate the numeric cap, by project, on the number of acres that may be disturbed, and (4) delete the discretionary clause addressing possible non-waiver of fees for actions within the urbanized exclusionary zone identified in the 1996 Biological Opinion. On October 31, 2001, the Service issued the 2001 Biological Opinion (File No. 1-5-96-F-023R.2) to BLM which incorporated the proposed modifications.

On September 10, 2004, BLM requested reinitiation of consultation on the 2001 Biological Opinion (File No. 1-5-96-F-023R.2). The purpose of this reinitiation was to address potential effects to the desert tortoise and Las Vegas buckwheat (*Eriogonum corymbosum* Bentham var. *nilesii* Reveal 2004), from the expansion of the land disposal boundary established in the 1996 Biological Opinion for the Las Vegas Valley consistent with the Southern Nevada Public Land Management Act (SNPLMA) of 1998, as amended. The SNPLMA requires the Secretary of Interior to select lands for disposal based on consultations with and nomination by local governments, consistent with community land use plans. While the Service has not proposed the Las Vegas buckwheat for listing as endangered or threatened under the Act, or not yet elevated the taxon to candidate status, BLM and the Service agreed conferencing was appropriate to identify pertinent conservation measures that would reduce the level of effects to the species. On December 20, 2004, the Service issued a biological opinion (File No. 1-5-96-F-023R.3) to address potential effects to the desert tortoise and Las Vegas buckwheat that may result from the modified disposal boundary. The action area for the subject consultation includes areas covered by the 2004 programmatic biological opinion for the Las Vegas Valley.

- *File No. 1-5-97-F-251.* On November 21, 1997, the Service issued a programmatic biological opinion to BLM for implementation of multiple-use actions within their Las Vegas District, excluding desert tortoise critical habitat, proposed desert tortoise ACECs, and the area covered by the Las Vegas Valley programmatic consultation. BLM may authorize activities within the programmatic area that may result in loss of tortoises or their habitat through surface disturbance, land disposal, and fencing, for a period of five years. The total area covered by this programmatic biological opinion is approximately 2,636,600 acres, which includes approximately 263,900 acres of BLM-withdrawn lands in Clark County. This programmatic consultation is limited to activities which may affect up to 240 acres per project, and a cumulative total of 10,000 acres, of desert tortoise

habitat excluding land exchanges and sales. Only land disposals by sale or exchange within the defined disposal areas in Clark County may be covered under this consultation up to a cumulative total of 14,637 acres. A maximum total of 24,637 acres of desert tortoise habitat may be affected by the proposed programmatic activities. BLM collects a remuneration fee of $705 per acre of disturbance of desert tortoise habitat, as indexed annually for inflation. The fees are used to fund management actions which are expected to provide direct and indirect benefits to the desert tortoise over time, which will assist in its recovery. The action area for the subject consultation includes areas covered by this programmatic biological opinion for the Las Vegas District.

- *File No. 1-5-98-F-053, as amended.* On June 18, 1998, the Service issued a programmatic biological opinion to BLM for implementation of the Las Vegas RMP (BLM 1998). The project area for this consultation covers all lands managed by BLM's Las Vegas Field Office, including desert tortoise critical habitat, desert tortoise ACECs, and BLM-withdrawn land. The action area for the subject consultation includes areas covered by this 1998 programmatic biological opinion. The Las Vegas Field Office designated approximately 648 square miles of tortoise habitat as desert tortoise ACEC in the Northeastern Mojave Recovery Unit, and approximately 514 square miles of tortoise habitat as desert tortoise ACEC in the East Mojave Recovery Unit, through the final RMP. As identified in the RMP, BLM manages 743,209 acres of desert tortoise habitat within four tortoise ACECs for desert tortoise recovery. To accomplish desert tortoise recovery in the Northeastern and Eastern Mojave Recovery Units, the Las Vegas Field Office implements appropriate management actions in desert tortoise ACECs through the RMP including:

1. Manage for zero wild horses and burros within desert tortoise ACECs.
2. Limit utility corridors to 3,000 feet in width, or less.
3. Do not authorize new landfills or military maneuvers.
4. Require reclamation for activities which result in loss or degradation of tortoise habitat, with habitat to be reclaimed so that pre-disturbance condition can be reached within a reasonable time frame.
5. Limit all motorized and mechanized vehicles to designated roads and trails within ACECs and existing roads, trails, and defined dry washes outside ACECs.
6. Allow non-speed OHV events within ACECs, subject to restrictions and monitoring determinations.
7. Prohibit OHV speed events, mountain bike races, horse endurance rides, four-wheel hill climbs, mini-events, publicity rides, high-speed testing, and similar speed based events.
8. Within ACECs, do not allow commercial collection of flora. Only allow commercial collection of fauna within ACECs upon completion of a scientifically credible study that demonstrates commercial collection of fauna does not

adversely impact affected species or their habitat. This action will not affect hunting or trapping, and casual collection as permitted by the State.

BLM currently collects a remuneration fee of $705 per acre of disturbance of non-critical desert tortoise habitat, as indexed for inflation. If desert tortoise critical habitat is disturbed, the Management Oversight Group's compensation formula is implemented (Hastey *et al.* 1991) and a factor of 3 to 6 is applied to the base rate of $705 per acre, resulting in a fee equivalent to $2,115 to $4,230 per acre of disturbance.

IV. Effects of the Action

Direct effects encompass the immediate, often obvious effect of the proposed action on the tortoise or its habitat. Indirect effects are caused by, or result from the proposed action, are later in time, and are reasonably certain to occur. In contrast to direct effects, indirect effects are more subtle, and may affect tortoise populations and habitat quality over an extended period of time, long after surface-disturbing activities have been completed. Indirect effects are of particular concern for long-lived species such as the tortoise because project-related effects may not become evident in individuals or populations until years later.

Site developments that may occur in the NCA, such as visitor facilities and rights-of-way are more likely to occur in the lower elevation sites associated with creosote-bursage or Mojave mixed scrub vegetation types, and would cause the most significant degree of habitat manipulation or even loss. These developments however, also would receive the greatest degree of BLM control and oversight. Following development, use of these sites would be occurring on areas where significant habitat modification has occurred, reducing the likelihood of tortoise encounter and increasing visibility and therefore ability to detect and avoid tortoises should they wander into the area. BLM estimates for the number of acres anticipated to be disturbed and rehabilitated over the next 10 years are identified in Table 2 below.

Mechanical disturbance of desert soils as a result of construction or development projects may cause: (1) changes in annual and perennial plant production and species composition including introduction of non-native plants and noxious weeds, or an expansion of their distribution; (2) soil loss due to increased rates of water and wind erosion; (3) reduced soil moisture; (4) reduced infiltration rates; (5) changes in soil thermal regime; and (6) loss of native seeds or their inability to germinate; and (7) compaction or an increase in surface strength (Adams *et al.* 1982; Biosystems 1991; Burge 1983; Bury and Luckenbach 1986 and 2002; Davidson and Fox 1974; Hinkley *et al.* 1983; Nakata 1983; Vollmer *et al.* 1976; Webb 1983; Wilshire 1977 and 1979; Wilshire and Nakata 1976; Woodman 1983). When the soil surface is exposed by vehicular activity (*e.g.*, OHVs), the thermal insulation provided by the vegetative cover is decreased, which results in increased daytime temperatures. Higher temperatures decrease the

soil moisture, which causes soil temperature to increase further because less heat is required to vaporize the water present. Revegetation is inhibited as a result of these processes (Webb *et al.* 1978).

Table 2. **Projected Disturbance/Reclamation for Sloan Canyon NCA, 2006-2016**

Facility/Area	Acres Reclaimed*	Acres Disturbed*
Visitor Center, including parking facilities		20
Utility ROWs (water, sewer, electric) Assume 20' wide for .5 mile		1.2
Quo Vadis Trailhead		5
Dutchman Pass Trailhead		5
Hidden Valley Trailhead		5
Designated Trails, including Henderson ROW Assume total length of new disturbance = 11 miles; 10 feet wide		13
Potential trails Assume a 30 mile boundary trail; 6 trails @ 4 miles; 15 trails @ 2 miles; each trail, with disturbance, 10 feet wide		102
Potential ROWs to outside applicants Henderson's North McCullough Road		42
Unauthorized Roads and Trails Assume ½ of identified roads and trails reclaimed = 32 miles at 10 feet wide	38	
Area Disturbances on NE portion of NCA	20	
Disturbance in Wilderness	4.5	
Total	**62.5**	**193.2**

* All acreage approximate

1. **Effects of recreation and visitor management activities:** Recreation activities likely to occur within the Sloan Canyon NCA include hiking, mountain biking, equestrian use, rock-climbing, dog exercise, hunting, nature study and sight-seeing, and dispersed camping. Boarman (2002b) determined that there were no known studies concerning the impacts of these activities on desert tortoise populations; however, there are likely impacts which include: illegal handling and disturbance of tortoises by the public; loss of habitat for trails and other recreational infrastructure; introduction and spread of alien plants by visitors and horses; vandalism; road kills by vehicles operated by recreationists traveling within the NCA; desert tortoise harassment, injury, or mortality by dogs if not

controlled; trampling of desert tortoises and their burrow as a result of cross-country equestrian activities; and increases in raven populations attracted by human presence and trash. Further, the potential increase in trash may result in injury or mortality of desert tortoise if ingested or if the tortoise becomes entangled. OHV activity, rock hounding, geo-caching, and recreational target shooting activities are prohibited throughout the NCA.

Potential effects to desert tortoise resulting from installation, use, modifications or improvements, and maintenance of recreational and visitor facilities may include: Mortality, injury or harassment of individuals as a result of vehicle encounters; disruption of behavior during construction or use of facilities; conducting activities during the periods of time when tortoise are most active; habitat disturbance resulting in loss of cover and forage; compaction of soils; habitat fragmentation; increased opportunities for collection or vandalism; introduction of alien plants and exotic animals by users and pack stock; injury or mortality encounters with visitors' pets; and illegal collection of desert tortoises or release of pet tortoises, including exotic species, increasing disease transmission or competition. Increased levels of surface-disturbing activities may increase the abundance of alien plants and wildfire frequency (Brooks *et al.* 2003).

Vehicles and equipment may stray from existing roads or designated areas and kill or injure tortoises, or crush their burrows. Tortoises may take shelter under parked vehicles and be killed, injured, or harassed when the vehicle is moved. Failure to report tortoise injuries and mortalities may result in additional take of tortoises if measures are not implemented to address the cause of such take. If BLM is not notified in advance of the project, proper oversight may not occur. If tortoise-proof fencing is installed, over time breaches may occur, thus allowing tortoises to pass through the barrier and be in harm's way. Temporary fencing left in place following the action or threat to tortoises in the area may contribute towards habitat fragmentation. Materials and equipment left behind following a project or action may be ingested by tortoises, entrap or entangle tortoises, attract desert tortoise predators such as common ravens and coyotes, or provide shelter for tortoises which when removed may result in displacement or injury of the tortoise.

Additional unauthorized impacts that may occur from casual use of the NCA include unauthorized trail creation; illegal shooting; and ground disturbance during search and rescue, abandoned vehicle recovery operations, or other administrative/law enforcement purposes, which may occur off existing roads, trails or other disturbed areas; and illegal OHV activities. Mountain bikes that stray off designated roads and trails, and cross-county equestrian activities will likely cause habitat damage and create new trails that may subsequently be used by recreationists.

2. **Effects of transportation activities:** The North McCullough Road is the only new access road proposed by BLM. Continued use of existing roads would result in effects to

the desert tortoise. Census data indicate that desert tortoise numbers decline as vehicle use increases (Bury *et al.* 1977) and that tortoise sign increases with increased distance from roads (Nicholson 1978). Tortoises often use roads which have depressions as drinking sites. Vehicular activity on unpaved roads following rains may preclude tortoises from drinking water, which may be available for only brief periods. Tortoises that move or occur in the paths of recreational vehicles may be killed or injured (Bury and Luckenbach 2002, Nicholson 1978), or collected as pets or food (Berry *et al.* 1996).

Other potential effects of these activities may include mortality, injury or harassment of individuals as a result of vehicle encounters including disruption of behavior during road construction, grading/paving/graveling, maintenance, and use of trails and roads. BLM's proposed action does not include habitat loss as a result of new road construction other than the North McCullough Road. Use of existing roads may result in habitat fragmentation; increased opportunities for collection or vandalism; introduction of alien plants and exotic animals; injury or mortality as a result of encounters with visitors' pets; and illegal release of pet tortoises including exotic species. Road kills and litter from vehicles and trail users may attract subsidized tortoise predators.

3. **Effects of permitted activities:** Issuance of SRPs and similar permits by BLM would authorize commercial activities, research, competitive activities, vending, organized group activities, and event use. Potential effects of vehicle tours on the desert tortoise are identified in the *Effects of Recreation and Visitor Activities* and *Transportation Activities* sections above. Failure to report permitted research or monitoring results may result in unnecessary future impacts to the species and lessen the recovery potential for the desert tortoise. Activities authorized by vending or competitive SRPs would mostly occur within previously disturbed areas and BLM determined that effects to the desert tortoise as a result of these permitted actions are negligible.

4. **Effects of habitat restoration, weed-control, and wildlife activities:** Actions may involve use of heavy equipment, all-terrain vehicles (ATVs), or hand-tools and include recontouring, ripping of soil, ground watering, broadcast seeding, use of water trucks for dust abatement, and planting of live vegetation. Use of vehicles and heavy equipment may increase the risk of injury or mortality of individuals, short-term displacement/noise during the project, short-term loss of vegetation (though unlikely), and temporary ground disturbance due to fencing or installation of barricades. Many potential effects of habitat restoration are the same as, or similar to, other surface-disturbing activities identified above. Activities associated with weed treatments that may affect the desert tortoise include application of herbicides; clearing or cutting vegetation by hand or with machinery; and use of ATVs on disturbed areas for site access. Effects to the desert tortoise include: unintentional removal/destruction of plants used by tortoises for forage or shelter; soil compaction; alteration of local microclimate through vegetation removal;

and harassment, injury or mortality of tortoises as a result of vehicle or machinery operation.

Beneficial effects include long-term improvement of species diversity (including food sources); long-term reduction in erosion; long-term increased habitat quality; increased tortoise abundance and distribution through habitat enhancement; decreased potential for future alien plant invasions; and decreased wildfire potential.

Activities that may affect desert tortoise through implementation of wildlife management actions include installation of artificial water sources, tanks, aprons and waterlines; helicopter staging and landing; capture and release of bighorn using traps, helicopters, and vehicles; clearing of vegetation and trenching or drilling for fence lines, posts, or other barricades; and drilling, bulldozing, filling excavations, recontouring the surface, and cross-country travel with heavy equipment for filling mine shafts (though typically associated with existing disturbances). Tortoises may become trapped and die in wildlife guzzlers if not properly designed. In 1996, a biologist with the California Department of Fish and Game reported 26 desert tortoise mortalities in 89 upland game guzzlers (Boarman 2002b).

5. **Effects of lands, realty, and mineral development activities:** Land actions include authorization of rights-of-way which may involve surface disturbing actions (effects described previously), trenching, blasting, blading and removal of vegetation, installation of structures, and maintenance of infrastructure. These actions can have the following effects to the species: crushing of tortoise burrows; removal of cover and forage plants; introduction/spread of exotic species; soil compaction; loss of habitat and cover resulting from ground disturbance; and harassment, injury or death of individuals from any of the above actions.

6. **Effects of capturing, handling, and relocating desert tortoises:** Blythe *et al.* (2003) found that Sonoran desert tortoises moved out of harm's way a distance less than 0.5 mile and returned to their home ranges within a few days. Unless movement barriers are in place, tortoises moved a distance of less than 0.5 mile out of harm's way are likely to return to potentially harmful conditions. Tortoises may die or become injured by capture and relocation if done improperly, particularly during extreme temperatures, or if they void their bladders. Averill-Murray (2001) determined that tortoises that voided their bladders during handling had significantly lower overall survival rates (0.81-0.88) than those that did not void (0.96). If multiple desert tortoises are handled by biologists/ monitors without protective measures including unused latex gloves, pathogens may be spread among the tortoises.

Summary of adverse effects associated with human presence in the NCA: Human activities in the Sloan Canyon NCA potentially provide food in the form of trash and litter, or water, which

attract tortoise predators such as the common raven, kit fox, and coyote (Berry 1985; BLM 1990). Natural predation in undisturbed, healthy ecosystems is generally not an issue of concern. However, predation rates may be altered when natural habitats are disturbed or modified. Common raven populations in some areas of the Mojave Desert have increased 1500 percent from 1968 to 1988 in response to expanding human use of the desert (Boarman 2002c). Since ravens were scarce in this area prior to 1940, the current level of raven predation on juvenile desert tortoises is considered to be an unnatural occurrence (BLM 1990). In addition to ravens, dogs have emerged as significant predators of the tortoise particularly near residential development. Dogs may range several miles into the desert and have been found digging up and killing desert tortoises (Service 1994, Evans 2001). Dogs brought to the NCA with visitors may harass, injure, or kill desert tortoises, particularly if allowed off leash to free-roam in occupied desert tortoise habitat.

Anticipated effects of conservation measures: Potential effects of recreation, visitor management, and transportation would be minimized by: imposition of a speed-limit and litter-control program; requiring the use of weed-free hay and removal of waste and temporary water troughs; restricting vehicular traffic to designated areas; moving tortoises out of harm's way (*e.g.*, on a road); reporting information to the Service on any take of desert tortoise; and designating roads/trails for recreation and visitor use, and closing those identified by BLM as unnecessary. Casual and dispersed recreation activities are enforced by BLM rangers and staff through public education, and through directing use to less sensitive areas.

Potential effects that may result from issuance of permits would be minimized by those measures identified above, and implementation of a tortoise awareness program; designation of a BLM representative to oversee permitted activities; checking underneath parked vehicles for tortoises before they are moved; use of previously disturbed areas where possible; removing project-related materials; avoiding desert tortoise burrows and periods of greatest tortoise activity; prohibiting ground disturbance and damage, collection, or introduction of plants or animals; and reporting research data to BLM and the Service. BLM's requirement for permittees to provide data collected under research or monitoring permits may contribute towards recovery of the tortoise by minimizing future impacts in the action area and increasing our knowledge base for the species.

Measures proposed by BLM to minimize potential effects to the desert tortoise that may result from habitat restoration, weed-control, wildlife activities, lands and realty actions, and mineral development include many of the measures identified above. In addition, BLM proposes to limit activities to marked or flagged areas; conduct desert tortoise clearance surveys; and require an onsite biologist. If ground disturbance is required, BLM may also require the proponent to disturb the least amount of habitat to accomplish the action; pay the appropriate remuneration fee; construct, inspect, maintain, and remove tortoise exclusionary fencing; and restore disturbances.

Potential effects of capturing and handling desert tortoises should be minimized by implementing Service-approved handling protocols and measures proposed by BLM which include requiring tortoise handlers and project monitors to be qualified and approved through an appropriate review processes; reporting tortoise mortalities/injuries associated with handling; and imposing temperature restrictions for handling/moving tortoises.

V. Cumulative Effects

Cumulative effects are those effects of future non-Federal (State, local government, or private) activities that are reasonably certain to occur in the project area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The vast majority of the human population in southern Nevada is concentrated in the Las Vegas Valley which includes Henderson and Boulder City, and has increased significantly over the past 20 years. Tourism is the major industry in the area and the proximity of Sloan Canyon NCA to Las Vegas makes the area very popular with tourists and locals. With tourism, there may be an increase of visitors not familiar with the area; their presence could lead to the capture or collection of desert tortoise and the use of vehicles off of existing roads and trails, further impacting the tortoise and its habitat. Increased vehicle traffic in the NCA may result in increased road kills.

Desert tortoise habitat at the interface between developed lands and open desert is most susceptible to negative impacts. There may be an alteration of predation rates beyond what could be considered normal. Public land adjacent to urban areas may be affected by indiscriminate use of firearms and OHV use by children as well as adults. The majority of the lands within the action area are administered by BLM. Therefore, any actions on these lands would be subject to consultation under section 7 of the Act. Other lands are covered under the Multiple Species HCP.

VI. Conclusion

After reviewing the current status of the desert tortoise, the environmental baseline for the project area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that implementation of programmatic activities as proposed in BLM's September 2005 BA is not likely to jeopardize the continued existence of the threatened Mojave population of the desert tortoise.

We have reached this conclusion for the following reasons:

(1) The action area does not include any areas designated for recovery of the desert tortoise;
(2) relatively few desert tortoises are likely to be killed or injured by actions approved by BLM which would be minimized by BLM's proposed conservation measures;
(3) other than ongoing actions such as non-permitted recreation and visitor use, no actions will proceed under this biological opinion until BLM submits required information on each project that *may adversely affect* the desert tortoise and a response has been received from the Service in accordance with the Service's draft guidance for programmatic biological opinions (Attachment A);
(4) desert tortoises in the North McCullough Wilderness will be conserved by land use restrictions in the area; and
(5) the potential loss of up to 193.2 acres of desert tortoise habitat as a result of the proposed action, represents less than 0.01 percent of the total available habitat within Clark County.

B. INCIDENTAL TAKE STATEMENT

Incidental Take for Programmatic Consultations

Each BLM action that may result in incidental take must have an incidental take statement, whether the action is the adoption of a strategy for developing future projects or the implementation of specific activities under the strategy. The take anticipated as a result of a specific action would be a subset of the programmatic incidental take statement. Though the intent in the appended programmatic approach is for the programmatic incidental take statement to contain all necessary reasonable and prudent measures and associated terms and conditions, due to the lack of available information regarding the specifics of individual projects, it may be necessary to develop project-specific reasonable and prudent measures and terms and conditions to ensure the minimization of the impacts of the incidental take associated with the specifics of each individual project. However, if this is the case, the Service would carefully consider whether the individual proposed project is beyond the scope of the programmatic consultation.

Section 9 of the Act, as amended, prohibits take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering (50 CFR § 17.3). "Harass" is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR § 17.3). Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant. Under the terms of sections 7(b)(4) and 7(o)(2) of the Act, taking

that is incidental to, and not intended as part of the agency action, is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The Service hereby incorporates by reference the conservation measures proposed by BLM from the *Description of the Proposed Action* into this incidental take statement as part of these terms and conditions, to be applied to future appended actions, as appropriate. Terms and conditions for actions covered under, or appended to, this opinion: (1) Restate measures proposed by BLM or provided below, (2) modify the measures proposed by BLM or provided below, or (3) specify additional measures considered necessary by the Service. Where action-specific terms and conditions (*i.e.*, terms and conditions developed for each action to be appended and covered under this programmatic opinion in the future) vary from or contradict the minimization measures proposed under the *Description of the Proposed Action* or general terms and conditions below, the action-specific terms and conditions shall apply. The measures described below are general in nature and may or may not apply to future actions proposed for appendage to this programmatic biological opinion. Terms and conditions that are specific to future BLM projects or actions are nondiscretionary and must be implemented by BLM so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply.

BLM has a continuing duty to regulate the activity that is covered by this incidental take statement. If BLM (1) fails to require the project proponent to adhere to the action-specific terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with action-specific terms and conditions, the protective coverage of section 7(o)(2) may lapse.

I. Amount or Extent of Take Anticipated

a. Based on the analysis of impacts provided above, history of effects from similar actions, anticipated scope of all future actions, minimization measures proposed by BLM, the Service anticipates that the following take could occur as a result of the proposed action:

1. An unknown number of desert tortoises may be incidentally taken as a result of land use and resource management activities during the 10-year period of this biological opinion. Based on desert tortoise population densities and scope of proposed activities, the Service estimates that two desert tortoises could be killed or injured during the term of this consultation and up to three desert tortoises per year could be taken by non-lethal means (capture and relocation).

   To ensure that the protective measures are effective and are being properly implemented, BLM shall contact the Service immediately if a desert tortoise is killed or injured as a result of any activity covered under this biological opinion.

Upon locating a dead or injured desert tortoise within the action area, notification must be made to the Service's Southern Nevada Field Office at (702) 515-5230. At that time, the Service and BLM shall review the circumstances surrounding the incident to determine whether additional protective measures are required. If more than two desert tortoises are found dead or injured during any calendar year, activities may proceed; however, BLM shall contact the Service immediately to determine whether formal consultation should be reinitiated. This threshold is intended to determine whether certain activities or circumstances may be affecting desert tortoises more substantially than we anticipated.

2. An unknown number of desert tortoise nests and eggs may be destroyed during BLM-authorized actions covered under this biological opinion. However, the Service anticipates that the number would be no more than one nest with eggs. BLM shall report impacts to any desert tortoise nests or destruction of desert tortoise eggs to the Service as specified above.

3. An unknown number of desert tortoises may be taken in the form of indirect mortality through predation by ravens drawn to trash; however, the Service believes that this number will be low based on BLM's proposal to implement measures to minimize predation.

II. Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or modification of critical habitat.

III. Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize the incidental take of desert tortoise:

1. BLM shall implement measures to minimize the incidental take of desert tortoises.

2. BLM shall implement measures to minimize adverse effects to desert tortoises found in harm's way that must be handled, captured, and moved.

3. BLM shall implement measures to minimize the incidental take of desert tortoises through impacts to desert tortoise habitat.

4. BLM shall implement measures to minimize the incidental take of desert tortoises resulting from attraction of potential tortoise predators to the actions area.

5. BLM shall implement measures to ensure compliance with the reasonable and prudent measures, terms and conditions, reporting requirements, and reinitiation requirements contained in this biological opinion.

IV. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, BLM must comply with action-specific terms and conditions, which implement the reasonable and prudent measures described above. Terms and conditions will be provided at the project-level consultation and are non-discretionary, and apply towards actions appended to this programmatic biological opinion. Terms and conditions will be based on measures proposed by BLM in this document to minimize the potential impacts to desert tortoise at the programmatic level and may be modified or replaced for specific actions. Additional measures may be required when specific actions are proposed for appendage to this programmatic biological opinion.

1. To implement Reasonable and Prudent Measure Number 1, BLM shall implement project-specific terms and conditions to incidental take of desert tortoise from future actions funded, conducted, or authorized by BLM. These measures will be provided as part of the Service's response to BLM's request to append actions to this biological opinion, based on the proposed conservation measures under the Description of the Proposed Action.

2. To implement Reasonable and Prudent Measure Number 2, BLM shall implement project-specific terms and conditions to minimize injury or death of desert tortoises that must be handled, captured, and moved out of harm's way. Measures (a-e) below are typically required to minimize potential effects to the desert tortoise that may result from handling. However, the Service may modify these measures or impose additional measures for future actions under this Biological Opinion.

   a. Tortoises that are moved offsite and released into undisturbed habitat on public land by an authorized tortoise biologist, must be placed in the shade of a shrub, in a natural unoccupied burrow similar to the hibernaculum in which it was found, or in an artificially constructed burrow in accordance with the tortoise handling protocol.

   b. Desert tortoises encountered experiencing heat stress will be placed in a tub, by an authorized tortoise biologist, with one inch of 76-90°F water for at least 20 minutes or until heat stress symptoms are no longer evident.

   c. Desert tortoises shall be treated in a manner to ensure that they do not overheat, exhibit signs of overheating (*e.g.*, gaping, foaming at the mouth, etc.), or are placed in a situation where they cannot maintain surface and core temperatures

necessary to their well-being. Desert tortoises shall be kept shaded at all times until it is safe to release them. No desert tortoise shall be captured, moved, transported, released, or purposefully caused to leave its burrow for whatever reason when the ambient air temperature is above 95°F (35°C). Ambient air temperature shall be measured in the shade, protected from wind, at a height of 2 inches (5 centimeters) above the ground surface. No desert tortoise shall be captured if the ambient air temperature is anticipated to exceed 95°F (35°C) before handling and relocation can be completed. If the ambient air temperature exceeds 95°F (35°C) during handling or processing, desert tortoises shall be kept shaded in an environment that does not exceed 95°F (35°C), and the animals shall not be released until ambient air temperature declines to below 95°F (35°C).

d. BLM and Service wildlife staff must approve the biologists to be used by the applicant to implement the terms and conditions of the biological opinion, or permit issued by BLM. Any biologist and/or firm not previously approved must submit a statement of qualifications in the Service-developed format, and be approved by the wildlife staff before authorized to represent BLM in meeting compliance with the terms and conditions of the biological opinion. Other personnel may assist with implementing conservation measures, but must be under direct field supervision by the approved qualified biologist.

e. In accordance with *Procedures for Endangered Species Act Compliance for the Mojave Desert Tortoise* (Service 1992), an authorized desert tortoise biologist should possess a bachelor's degree in biology, ecology, wildlife biology, herpetology, or closely related fields as determined by BLM and the Service. The biologist must have demonstrated prior field experience using accepted resource agency techniques to survey for desert tortoises and tortoise sign, which should include a minimum of 60 days field experience. All tortoise biologists shall comply with the Service-approved handling protocol (Desert Tortoise Council 1994, revised 1999). In addition, the biologist shall have the ability to recognize and accurately record survey results and must be familiar with the terms and conditions of the biological opinion that resulted from project level consultation between BLM and the Service.

3. To implement Reasonable and Prudent Measure Number 3, BLM shall implement terms and conditions to minimize the incidental take of desert tortoises through impacts to desert tortoise habitat. These measures will be provided as part of the Service's response to BLM's request to append actions to this biological opinion, based on the proposed conservation measures under the Description of the Proposed Action.

4. To implement Reasonable and Prudent Measure Number 4, BLM shall implement project-specific terms and conditions to minimize the incidental take of desert tortoises

resulting from attraction of potential tortoise predators to action areas. These measures will be provided as part of the Service's response to BLM's request to append future actions to this biological opinion, based on the proposed conservation measures under the Description of the Proposed Action. The measure below typically is provided to minimize effects to desert tortoises from potential desert tortoise predators.

A litter-control program will be implemented and enforced by the project proponent or BLM. Trash containers shall remain covered, must be raven-proof, and emptied frequently enough to prevent overflow of materials. Trash, litter, project debris, etc. shall be transferred to a designated solid waste disposal facility. Vehicles hauling trash must be secured to prevent litter from blowing out along the road.

5. To implement Reasonable and Prudent Measure Number 5, BLM shall ensure compliance with this programmatic biological opinion, through implementation of terms and conditions at the action-level, and reporting and reinitiation requirements contained in this biological opinion. These measures will be provided as part of the Service's response to BLM's request to append future actions to this biological opinion.

V. Conclusion

The Service believes that no more than two (2) desert tortoises may be incidentally taken over the 10-year period of this consultation and three (3) desert tortoises taken by non-lethal means, per year. In addition, an unknown number of tortoises may be incidentally taken as a direct or indirect result of increased abundance of tortoise predators. One desert tortoise nest/egg may be incidentally taken as a direct or indirect result of activities covered under this biological opinion over the 10-year term. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed actions. If, during the course of the actions, this level of incidental take is reached and anticipated to be exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. BLM must immediately provide an explanation of the causes of the taking, and review with the Service the need for possible modifications of the reasonable and prudent measures.

In addition to the anticipated incidental take, a cumulative total of 193.2 acres of desert tortoise habitat may be disturbed as a result of actions under purview of this biological opinion.

Reporting Requirements

Upon locating a dead or injured endangered or threatened species, initial notification must be made to the Service's Southern Nevada Field Office at (702) 515-5230. Care should be taken in handling sick or injured desert tortoises to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of

cause of death. In conjunction with the care of sick or injured desert tortoises or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by the Service to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

Injured desert tortoises shall be delivered to any qualified veterinarian for appropriate treatment or disposal. Dead desert tortoises suitable for preparation as museum specimens shall be frozen immediately and provided to an institution holding appropriate Federal and State permits per their instructions. Should no institutions want the desert tortoise specimens, or if it is determined that they are too damaged (crushed, spoiled, etc.) for preparation as a museum specimen, then they may be buried away from the project area or cremated, upon authorization by the Service. BLM shall bear the cost of any required treatment of injured desert tortoises, euthanasia of sick desert tortoises, or cremation of dead desert tortoises. Should sick or injured desert tortoises be treated by a veterinarian and survive, they may be transferred as directed by the Service.

C. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service hereby makes the following conservation recommendations:

1. Conduct desert tortoise surveys in the Sloan Canyon NCA to locate and map relative abundance of desert tortoise. Those areas of tortoise populations that are moderate or greater density should be managed as avoidance areas.

2. BLM should manage currently undeveloped lands adjacent to the Sloan Canyon NCA to maintain connectivity of desert tortoise habitat within the NCA with adjacent habitat. These lands should continue to function as a relatively large block of unfragmented, desert tortoise habitat.

3. Specific kiosks in the Sloan Canyon NCA should be designed to include public information about the conservation of the desert tortoise and other Mojave Desert wildlife particularly those subject to collection or vandalism.

4. Within Sloan Canyon, inventory user-defined trails and prioritize these trails for closure and restoration to protect sensitive species.

5. Coordinate with scientists from the U.S. Geological Survey-Biological Resources Division to develop and implement alien plant control procedures within Sloan Canyon

NCA, which may include application of pre-emergent herbicides, and ways to minimize the threat to desert tortoise and their habitat from wildfires.

In order for the Service to be kept informed of actions that either minimize or avoid adverse effects or that benefit listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

D. REINITIATION REQUIREMENT

This concludes formal consultation on the actions outlined in your September 20, 2005, request. As required by 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over an action has been retained (or is authorized by law) and if: (1) The amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We appreciate the assistance and cooperation of your staff throughout this consultation process. If we can be of any further assistance, please contact Michael Burroughs in our Southern Nevada Field office in Las Vegas, at (702) 515-5230.

Cynthia T. Martinez

for Robert D. Williams

Attachments

cc: (w/o attach)
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Attachment A

PROGRAMMATIC CONSULTATION GUIDANCE
(7/16/03)

INTRODUCTION

Under section 7(a)(2) of the Endangered Species Act of 1973, as amended (Act), each Federal agency must, in consultation with the Services, ensure that any action it funds, authorizes, or carries out will not jeopardize the continued existence of listed species or adversely modify designated critical habitat. In recent years the Services' section 7 consultation workload has increased dramatically resulting in the need to develop techniques to increase the effectiveness of the consultation process. One of the most effective methods of accomplishing this has been the implementation of "programmatic consultation" in both the formal and informal consultation processes. As the use of programmatic consultation techniques has increased there has been a growing need for guidance to ensure consistency with the various requirements of the Act and its implementing regulations. This guidance document is provided to assist in ensuring this consistency.

Programmatic consultation has become a generic term encompassing several different types of Endangered Species Act section 7 consultations. One type evaluates the potential for Federal "programs" to affect listed and proposed species and designated and proposed critical habitat, hereafter referred to collectively as "listed resources." These programs may establish standards, guidelines, or design criteria to which future actions must adhere, for example, Forest Service Land and Resource Management Plans and Bureau of land management resource management plans. Another type of programmatic consultation that has been effectively used addresses a large group of similar actions (e.g., a national forest's timber harvest program for a particular year) or different types of actions proposed within a large geographic area. These types of programmatic consultations address the effects of an identified group of defined actions rather than the standards or design criteria that will be used to develop future actions.

Programmatic consultation techniques have the greatest potential to increase the efficiency of the section 7 consultation process because much of the effects analysis is completed one time up front rather than repeatedly each time a new action, or batch of actions, is proposed. By completing this analysis up front in a programmatic consultation document, the anticipated effects of the action agency's future projects can be added into the environmental baseline prior to their actual completion. This provides predictability for action agencies as they can be assured that the effects of their future actions have already been broadly accounted for. Thus, all other future section 7 consultations (i.e., those not covered by the programmatic consultation document) will be evaluated within the context of these effects having already been added to the

environmental baseline. By completing this analysis up front, the process for completing consultation for future actions proposed under the programmatic consultation can be dramatically shortened.

Some of the benefits of programmatic consultations include: 1) better and more cost effective integration of ecosystem/recovery planning activities with agency activities; 2) streamlined consultation processes; 3) added predictability for all parties; 4) minimization of the potential "piecemeal" effects that can occur when evaluating individual projects out of the context of the complete agency program; and 5) the opportunity to better and more efficiently integrate the action agency's 7(a)(1) responsibilities at the program level.

IMPLEMENTING AUTHORITY

There are several points about programmatic consultation processes that need to be established to ensure a common understanding and consistent and appropriate implementation:

1. A variety of court decisions have made it clear that Federal agencies must consult on the implementation of programs, plans, or strategies that guide the development and implementation of future site-specific action (see Pacific Rivers Council v. Thomas, 30 F.3d 1050, 1052 - 1053 (9th Cir. 1994); Lane County Audubon Society v. Jamison, 958 F.2d 290, 293 (9th Cir. 1992); Silver v. Babbitt, 924 F.Supp. 976 (D. Ariz. 1995); Silver v. Thomas, 924 F.Supp. 976 (D. Ariz. 1995).

2. In cases where a Federal agency adopts or approves a management plan or strategy that will be used to guide the development and implementation of future projects, there are typically at least two "tiers" of Federal agency action; the first tier action of adopting the management plan or strategy and second tier actions involving implementing site-specific projects, such as issuance of an oil and gas lease, under the management plan or strategy. The courts have ruled that the decision to adopt plans (or strategies) that guide the implementation of future individual actions, as well as each future individual action itself, must complete the requirements of section 7 consultation (see Lane County Audubon v. Jamison, at 293; Pacific Coast Federation of Fishermen's Association v. National Marine Fisheries Service; Pacific Coast Federation of Fishermen's Association v. National Marine Fisheries Service, 71 F.Supp. 2d 1063 (W.D. Wa. 1999); Pacific Coast Federation of Fishermen's Association v. National Marine Fisheries Service, No. 99-36027 (9th Cir. 2001)).[1]

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[1]Note that to the best of our knowledge the courts have not directly addressed this issue in a single case, rather, a series of cases must be reviewed to piece together the courts views. For example, while Lane County Audubon v. Jamison addressed the need for consultation at the plan

3. Each action that may directly or indirectly affect listed species or designated critical habitat (in this case, either adoption of the plan or implementation of any specific project under that plan) must have the appropriate Endangered Species Act effects analysis and associated documentation. In other words, any action that is determined "may affect, but is not likely to adversely affect" a listed species or designated critical habitat must have a written concurrence from the Service, while any action that is determined to be "likely to adversely affect" listed resources must have a **complete** biological opinion (including an incidental take statement, where appropriate[2]) (Conner v. Burford, 848 F.2d 1441 (9th Cir. 1988), Conner v. Burford, 605 F.Supp. 107 (D.Mont.1985), Silver v. Babbitt, Silver v. Thomas,).

4. When developing an effects analysis and associated incidental take statement that includes future actions for which insufficient information is available to make accurate determinations (e.g., when consulting at the plan level and the specific future activities and locations are not yet identified), in the effects analysis the Service must provide the benefit of the doubt to the species and develop reasonable projections of potential conflicts between activities that can occur under the agency's program and the protection of listed species. From this, the Service must estimate the potential effects and derive the anticipated level of incidental take that is likely to occur. Note that these estimated levels of effects should correspond to the maximum level of impacts that may be caused by the action (see Conner v. Burford, 848 F.2d 1441, Silver v. Babbitt, Silver v. Thomas).

5. The Service must ensure that the environmental baseline is appropriately tracked during implementation of programmatic consultations. This is described in greater detail below.

PROGRAMMATIC CONSULTATION APPROACHES

There are three commonly used programmatic consultation approaches: Batched, Appended, and Tiered. All three approaches fulfill the standards identified in the "Implementing Authority"

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level, the Pacific Coast Federation of Fishermen's Association v. National Marine Fisheries Service cases addressed the need for review of future actions implemented under an action agency's plan.

[2]This concept is further discussed in the "PROGRAMMATIC FORMAL CONSULTATIONS" and "PROCEDURES FOR COMPLETING PROJECT-LEVEL CONSULTATION" sections below.

section above, however, the manner in which they fulfill these requirements differs. Following are brief descriptions of each approach.

1. Batched Programmatic Consultation Approach: The "batched" approach is widely used throughout the different regions of the country. Under this consultation approach, the action agency groups, or batches, a series of proposed projects into one proposed action and the Services produce a single biological opinion. If all the proposed projects are not likely to adversely affect listed species or designated critical habitat, the Services produce a single concurrence letter to fulfill the action agency's consultation requirements. In effect, several individual consultations are combined into one document. The design of each project is sufficiently developed to accurately assess its potential effects and anticipated take, if any. Thus, the effects of each project are evaluated both individually and cumulatively within one document. This approach is only appropriate when the action agency has sufficiently developed the details of its future actions to allow for the accurate evaluation of their impacts.

2. Appended Programmatic Consultation Approach: This is a two-stage consultation process. The first stage involves the initial development of a programmatic biological opinion, or concurrence if no adverse effects are anticipated, that analyzes the potential landscape-level effects that may result from implementing the design criteria of the action agencies' program. The second stage involves the development of appropriate project-specific documentation that addresses the specific effects of individual projects proposed under the action agency's program. Upon completion of the project-specific review, the associated documentation is appended to the programmatic biological opinion, or concurrence document. This programmatic document, together with the appended project-specific documentation, encompasses the complete consultation document for each individual project.

3. Tiered Programmatic Consultation Approach: Like the Appended approach, the Tiered approach is a two-stage consultation process with the two stages fulfilling the same purposes. The first stage biological opinion or concurrence, as appropriate, evaluates the landscape-level effects of applying the action agency's design criteria to develop future actions. The second stage results in the completion of project-specific documentation that addresses the specific effects of each individual project developed through application of the design criteria. The difference between approaches is the manner in which they achieve these purposes. Under the Tiered approach, two complete consultation documents, biological opinions or concurrence documents, are completed for each stage, with the second-stage documents "tiering" to the first-stage document by incorporating portions of it by reference. Thus each action has its own individual consultation document that is supported by the programmatic document.

TYPES OF "PROGRAMS"

There are a variety of "program" types, each with varying characteristics that present differing challenges for section 7 consultation. The types of programs that are easiest to deal with in section 7 consultation are those that have a series of defined actions that are grouped together, for example, a National Forest's annual timber harvest program or "increment." These often involve a series of defined timber harvest actions that have been grouped into that year's proposed activities for the Forest. Because these proposed actions are fully developed, it is possible to relatively accurately anticipate their potential effects. Consultations for these programs can typically be completed through a "batched programmatic" consultation approach. Because the specifics of each individual action contained within the program are known, a single consultation may be completed at the program-level without the need for additional review.

More challenging programs to complete consultation on are those that do not have defined actions, but only contain the design standards that will be used to develop future actions. These programs typically contain substantial temporal and spatial uncertainty regarding future actions, resulting in corresponding uncertainty regarding potential effects. This uncertainty results in the need to complete two levels of consultation, program- and project-level. Consultations on these types of programs are typically completed using the tiered or appended programmatic consultation methods.

Perhaps the most challenging programs to complete consultation on are those that have not defined their future projects nor formalized design standards to be applied to the development of future actions, but rather contain "goals" for the action agency to achieve. In reality these goals become the design standards, but they are applied to the landscape rather than to individual future projects. For example, an action agency's program may require that as they implement their activities they maintain 500 total acres of listed species habitat. Thus, they have landscape-level design standards as opposed to project-level design standards. These types of programs typically have large amounts of uncertain associated with their future effects. Consequently, consultation on these types of programs often require the Service to work jointly with the action agency to development assumptions that can be used to narrow the effects analysis. More will be discussed on this issue in the "UNCERTAINTY" section below.

CONSULTATION, COORDINATION, COOPERATION, AND INFORMATION REQUIREMENTS

The consultation, coordination, and cooperation procedures identified in this section are appropriate for each of the programmatic consultation types, but they are particularly important for the Appended and Tiered approaches. This is because these two approaches involve the completion of program-level consultation documents prior to the development of specific projects; thus the consultation will be completed on implementation of the standards the action agency will apply when developing its future actions.

In accordance with 50 CFR 402.14(c), to initiate formal section 7 consultation action agencies provide the Services with:

1. A description of the action to be considered;

2. A description of the specific area that may be affected by the action;

3. A description of any listed species or critical habitat that may be affected by the action;

4. A description of the manner in which the action may affect any listed species or critical habitat and an analysis of any cumulative effects;

5. Relevant reports, including any environmental impact statement, environmental assessment, or biological assessment prepared; and

6. Any other relevant available information on the action, the affected listed species, or critical habitat.

When initiating informal consultation an action agency uses this same information to determine whether its proposed action is likely to adversely affect listed species; this information is then provided to the Services for evaluation.

The Services and action agencies have found that by engaging in early planning and coordination while compiling the above information, the Services' Endangered Species specialists and the action agencies' technical experts can identify and address issues and make appropriate adjustments while there is the maximum flexibility to modify project designs. Such early coordination allows managers to make appropriate adjustments to proposed activities during the project design phase to incorporate species' habitat needs, thus facilitating and expediting the section 7 consultation process.

During section 7 consultation the Services must:

1. Review all relevant information that is provided by the action agency or is otherwise available;

2. Evaluate the current status of the listed and proposed resources to be affected (this includes an evaluation of the threats facing these listed and proposed resources), and the environmental baseline within the action area;

3. Evaluate the effects of the proposed action and cumulative effects on the listed and proposed resources;

4. Use the above information to determine the effects of the proposed action on the conservation status of the listed species (i.e., evaluate the potential for the proposed action to result in jeopardy or adverse modification). (From 50 CFR 402.14(g)).

In addition, the regulations direct the Services to discuss this analysis with the action agency. The early coordination process has been particularly effective when the action agencies and Services have jointly completed the requirements of consultation identified above and developed project design criteria or standards. Such design criteria are often identified so that projects can be readily classified into one of three consultation effects categories – "no effect," "not likely to adversely affect," or "likely to adversely affect." This approach provides predictability to action agencies as they can anticipate the procedures that will be used to complete section 7 consultation for projects that meet the specified standards. Once a project has been developed to meet the design criteria, the consultation typically can be completed relatively quickly. The development of design criteria is discussed in further detail below. Developing projects in a manner that ultimately reduces adverse effects to listed and proposed resources can often most effectively streamline the consultation process.

Implementation of this process within the action agencies' programs: (1) lays the foundation for the landscape-level perspective needed to implement programmatic consultation procedures that can greatly accelerate the consultation process; (2) provides the structure for identifying, evaluating, and balancing the short-term risks and long-term benefits of future activities; and (3) facilitates the development of section 7 consultation "triggers" (i.e., triggers for informal or formal consultation).

Developing Design Criteria

At times, though not in all circumstances, it will be appropriate to develop design criteria or standards to guide the development of future projects. The following process for developing design criteria has been adapted from procedures that have been found to be particularly effective in streamlining section 7 consultation. To begin the design criteria development process, the Services and action agencies should commit personnel with appropriate biological expertise and with expertise related to carrying our the action agency's program activities. It is important that these personnel function as a unified team with common goals and objectives. For this reason it may be appropriate that each agency's representatives spend some time becoming familiar with the other agencies' needs and limitations.

Design criteria can be developed through a five-step process. These steps are designed to integrate species' needs with the needs of the action agencies and to provide a means to jointly fulfill the requirements of section 7 consultation identified in the "Pre-consultation, Coordination, and Cooperation" section above. All available relevant information should be used to complete each step. This information should be updated as necessary.

1. Identify the conservation needs of each listed species. Using information from listing rules, recovery plans, past consultation documents, recovery outlines, etc., identify the conservation needs of the species within the context of their feeding, breeding, sheltering, and dispersal. While these conservation needs may be pertinent to the species throughout its range, particular attention should be paid to their needs within the action area;

2. Identify the threats to each listed species' conservation, both range-wide and within the action area, along with the level of concern associated with each threat. The threats that the action agencies can influence should be specifically identified. When possible, these threats should be categorized by the five listing factors identified in section 4 of the Act in order to best facilitate the development of future effects analyses;

3. Identify species conservation or management units (e.g., watersheds, action agency management districts, resource areas, field offices, etc.), and the threats affecting each unit. These units may be based on various factors such as the ecological roles that each will be expected to fulfill in providing for the conservation of the species, the different types of actions that will be implemented within the area, differences in ecological conditions, etc. The intent is to maintain flexibility in the scale of these units to allow them to vary with the needs of each individual situation. This step should use information developed in the previous steps;

4. Identify species' conservation goals framed within the context of the action agencies' programs and authorities. These conservation goals should be derived from the information developed in the previous two steps, should consider the ecology associated with the predominant habitat types, and should utilize information regarding the specific types of future activities the action agencies will be proposing. In this step the biological justification for each goal and potential methods for achieving it should be presented. The goals typically should be broad in nature, allowing for flexibility in project designs to meet the needs of individual situations. In other words, they should identify "what" to achieve rather than "how" to achieve it;

5. Develop conservation/management unit strategies for implementing future activities. This will typically involve the development of design criteria for future projects. These "sideboards" will be based on the information developed in the previous steps and will provide guidance to agency personnel for use in developing future actions. The sideboards should provide for efficient progress towards beneficial long-term objectives while ensuring that short-term effects do not rise to the level of jeopardy or adverse modification. If the sideboards are designed correctly, and if future projects are developed within them, the action

agencies will have high assurance of the results of future section 7 consultations. This predictability can be invaluable to planning and preparation processes.

Completion of these steps fulfills two main streamlining objectives. First, it completes a substantial portion of the effects analysis at one time and early in the consultation process. In the standard consultation process, these steps are typically not completed until the latter part of consultation and are repeated for each individual proposed action. Completing this process early and one time is an effective technique for streamlining future consultations. Second, it will result in design criteria that reduce potential adverse effects to listed resources within the constraints of the action agency's needs and provides a predictable consultation process. Developing conservation strategies early in the design process when there is relative flexibility has the potential to minimize the costs and disruptions to project planning processes.

UNCERTAINTY

When completing consultation on an action agency's program standards or design criteria there is often uncertainty regarding potential effects due to the action agency's uncertainty regarding specific future projects. For example, while an action agency may commit to using certain design criteria whenever a project will occur within a specified distance of listed species habitat, until the projects are fully developed, it may not know how many will fall within this distance. Thus, the total effects that will result from program implementation may not be known. Or, while the action agency may commit to surveying each future project-site prior to implementing activities, until they complete the surveys they may not know how many individuals will actually be impacted.

As stated previously, when such uncertainty exists, the Services must provide the benefit of the doubt to the species and use "reasonable worst case" assumptions. This results in the Services examining the greatest levels of impacts that can occur from projects that meet the program standards. This evaluation is then refined through the project-level consultation. This approach is followed to ensure that the action agency can fulfill its responsibilities under section 7(a)(2) of the Act to "insure" that actions implemented under their "program" are not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat. Failure to employ this approach and instead limiting the effects analysis to address only some of the effects that can result from the program under consultation would have the effect of the Services inappropriately narrowing the action agency's proposed action.

However, at times uncertainty regarding the potential effects of future actions developed through implementation of the action agency's program may be so great that it is not possible to accurately project the potential effects that may result. To address these situations the Services should work with the action agency to jointly develop "assumptions" that will be used to constrain the effects analysis. Both the action agency and the Services must believe that these assumptions will be met as the proposed program is implemented; failure of one of the

assumption may result in effects that were not analyzed in the biological opinion and the need to reinitiate consultation. For this reason it is important that the agreed upon assumptions be appropriately narrow so as to address only the issues of concern. For example, for a program that will impact a species that is dependent on late-successional habitat there may be concern regarding the potential level of future impacts because the program as proposed contains no measures that would limit impacts to late-successional habitat types. As a result the Services would have to analyze the effects of the action agency impacting all of the late-successional habitat within the action area. Alternatively, the action agency and Services could jointly develop appropriate assumptions that can be used to narrow the effects analysis. During the ensuing discussions it is determined that concern only exists in a few areas within the action area and that the action agency does not foresee substantial impacts to these areas. Therefore, the action agency and Services jointly agree upon limits on the impacts to late-successional habitat. However, rather than applying these limits to all late-successional habitat, these limits are narrowly applied only to the areas of concern for the listed species. This results in a jointly developed assumption that no more than the agreed upon number of acres of late-successional habitat will be impacted in the areas of concern for the listed species.

Through the development of such assumptions, the action agency is essentially agreeing to conditions that must be adhered to in order to ensure that the consultation document and any accompanying incidental take statement remain valid. For this reason the assumptions must be clearly documented and monitored as appropriate. To accomplish this, the Services will identify each jointly developed assumption within both the "Description of the Proposed Action" and "Effects of the Action" sections of the biological opinion. Each assumption should be identified in the appropriate location; for example, if the assumption that not more than 50 acres of wetland fill will occur within a county in any one year is developed, then in the portion of the "Description of the Proposed Action" section that talks about wetland fill, the Services will cite the previous discussions with the action agency and the resulting jointly developed assumption.

Once the appropriate assumptions are jointly developed, procedures for ensuring that they are met should be jointly developed and implemented by the action agency. In many cases these procedures may be as simple as reporting at agreed upon time intervals that each assumption continues to be met. The procedures for monitoring the validity of the assumptions may be incorporated into the project design by the action agency, or, in the case of the assumptions affecting the potential impacts of take, the procedures may be presented within the incidental take statement. Regardless, like the assumptions themselves, the procedures for monitoring them should be jointly developed and agreed upon. If the monitoring needed to assure the validity of an assumption cannot be agreed upon, then it may not be appropriate to use such assumption. This will depend in part on the sensitivity of the effects analysis to the validity of the assumption. For example, if after further analysis it is determined that failure of an assumption would not change the results of the effects analysis, then the Services should document this analysis to provide justification for not validating the assumption and monitoring would not generally be necessary.

This might particularly be the case when the Services and action agency have agreed to assume species presence in the absence of surveys. For example, if impacts to the species' habitat are of concern to the species' conservation rather than take of the individuals associated with this habitat, when the project-level review is conducted, the agencies may agree that based on the available information and providing the benefit of the doubt to the species, species presence is a valid assumption. The Services would have to clearly and concisely establish the justification for this assumption in the biological opinion (e.g., the presence of suitable habitat, the proximity of the action area to known species' locations, the history of the species occurring in similar habitats under similar circumstances, etc.). Then the Services would explain the relative value to the conservation of the species of the habitat within the action area as opposed to the individuals utilizing that habitat. The Services would further explain that due to these relative values the effects analysis and resulting determinations would be relatively unchanged if the assumption holds true or not. Finally, the Services would use this analysis to justify not validating the assumption of species presence through surveys.

The biological opinion should identify the procedures to be followed if at any time it is found that an assumption has not been met. These procedures may include a reassessment of the effects to listed species while the action agency continues their operations, they may require the halting of activities until the reassessment can be completed, or they may include agreed upon corrective measures that are designed to compensate for the unexpected effects. These procedures will vary with individual circumstances and will be dependent on the environmental consequences that result, as well as the constraints of the action agency. When completing consultation, the Services must carefully consider the consequences of making incorrect assumptions. If the consequences are sufficient to result in a section 7(a)(2) violation, then the assumption in question must be closely monitored and accompanied by compensatory measures that can be implemented to avoid such violation in the event of the assumptions failure. Again, any compensatory measures must be jointly developed and agreed upon.

Following is an example of the appropriate use of assumptions in the consultation process.

> A land management agency requests programmatic consultation on the implementation of a road maintenance program on their land management unit. This area encompasses an entire recovery unit for an endangered butterfly species and supports more than 30 known occupied areas. The land management agency has implemented this road maintenance program for many years, but it has only recently come to their attention that they should complete section 7 consultation on the program's implementation.
>
> The butterfly species appears to be maintaining its population numbers in the management area and upon further investigation the action agency and Service determine that the butterfly species is actually using puddles that form in road potholes to obtain nutrients. While this is a beneficial effect of maintaining the road system, an undetermined number of butterflies are killed through vehicular collisions.

While evaluating the effects of the proposed action, the Service discovers that the only information regarding effects provided by the action agency is that while the proposed management activities have been implemented in the past the butterfly population size has remained steady, thus indicating that the proposed actions will not jeopardize the continued existence of the species. The Service's response to the action agency is that while this is an indication that the butterfly population may have reached an equilibrium under the current management scheme, to determine the effects of the action (and thus whether jeopardy is avoided), the size of the current population (population size with the proposed action) must be compared to the population size that would exist without the proposed action. This analysis will provide an indication of the effects of the proposed action and allow for an evaluation of the jeopardy potential. Without completing such an analysis the Service may fail to recognize the potential that while the butterfly population has remained stable under the existing management regime, this management may have actually kept the population from expanding and populating other important areas, thus limiting the likelihood of the species surviving and recovering.

While working with the action agency the Service determines that to evaluate the effects they need to obtain information regarding: (1) the number of miles of roads that occur within butterfly habitat; (2) the average number of potholes that exist per mile of road; (3) the frequency of pothole use by butterflies; (4) the average number of vehicles that use the roads per unit of time; and (5) the frequency with which a single vehicle strikes butterflies. In an effort to assist in evaluating the effects of their proposed action, the action agency determines that there are 50 total miles of road within butterfly habitat and based on a quick survey, there is an average of 30 potholes capable of puddling water per mile of road. After reviewing the scientific literature, base on previous studies in similar areas, the Service determines that it is reasonable to expect five percent of the butterflies on the road to be taken via vehicles. However, no information can be found regarding the frequency of pothole use by the butterflies or the average number of vehicles that use the roads per unit of time.

To address these areas of uncertainty, the Service and action agency meet and jointly develop reasonable assumptions to use for the missing pieces of information. Based on anecdotal observations of the action agency's biologists, an assumption regarding pothole use of 15 butterflies per pothole during the active hours of the day over the 38-day average flight season is jointly developed. Based on the anecdotal observations of the action agency's maintenance staff, an assumption of 30 cars per hour during the active hours of the day during the flight season is developed. These assumptions are clearly identified in the biological opinion and are used by the Service to complete an effects analysis. The results of this analysis indicate that the proposed action is not likely to jeopardize the continued existence of the butterfly species. However, after assessing the sensitivity of the effects analysis to the validity of the assumptions, the Service determines that changes in the assumptions could greatly affect the outcome of the effects analysis and, therefore, of the impacts of the resulting incidental take. For this reason,

under 50 CFR 402.14(I)(3), with the agreement of the action agency, the Service requires the action agency to conduct monitoring during the first two years of project implementation to confirm the accuracy of the assumptions. Should the monitoring indicate that the assumptions are inaccurate, the consultation would be reinitiated and the effects analysis revised.

Note that in the above example if the action agency had determined that they were unable to complete the monitoring, then the Service would have had to complete the effects analysis using the "reasonable worst case" values for the areas of uncertainty. Thus, it is essential that both the assumptions as well as the needed monitoring be jointly developed and agreed upon.

PROGRAMMATIC INFORMAL CONSULTATION

For groups of projects or programs that will produce future projects that are not likely to adversely affect listed resources, programmatic informal consultation can be completed. Such an approach can lead to better assessments of landscape-level impacts, workload savings, and strengthened administrative records. The greatest workload savings is achieved when the specifics of future actions are know with sufficient detail to complete a "batched concurrence." Under this approach a single concurrence document is produced for a group, or "batch," of projects that are not likely to adversely affect listed resources. While the short-term workload savings for doing a tiered or appended programmatic informal consultation may not be as great without some form of "batching" because the project-specific documentation created is similar to a standard concurrence letter, tiering or appending to a programmatic document may still strengthen the Federal Government's administrative record. In addition, such an approach can produce sufficient guidance for action agencies to ensure that their actions will avoid adverse effects to listed resources. Both of these factors can provide long-term workload savings. For information on the procedures for completing programmatic informal consultation, see the "PROCEDURES FOR CONDUCTING PROGRAMMATIC CONSULTATION" section below.

PROGRAMMATIC FORMAL CONSULTATION

For groups of projects or programs that will produce future projects that are likely to adversely affect listed resources, programmatic formal consultation should be conducted and a programmatic biological opinion should be completed. It is important to remember that if even one project that is likely to adversely affect listed resources will result from implementation of the program or guidelines, then formal consultation must be conducted and a complete biological opinion produced. In addition, if such activities are going to result in incidental take, then the biological opinion should be accompanied by an incidental take statement. Depending on the level of project-specific information available at the time of the program-level consultation, the incidental take statement may require a project-level review before the incidental take exemption takes effect. Additional information regarding incidental take and incidental take statements can be found in the sections that follow below.

Program-level Biological Opinions

For groups of projects or programs that will produce future projects that are likely to adversely affect listed resources, regardless of the approach used, programmatic formal consultation must be conducted and a program-level biological opinion must be completed. In the next section ("PROCEDURES FOR COMPLETING PROJECT-LEVEL CONSULTATION") some of the approaches for completing project-level consultation are discussed. These approaches are used in combination with the development of program-level biological opinions. For this reason it may be useful to review this section again once you have completed your review of the following sections.

Though there are some differences in the program-level consultation processes depending on which approach is pursued, program-level biological opinions contain all of the elements found in a standard biological opinion. The "PROCEDURES FOR COMPLETING PROJECT-LEVEL CONSULTATION" section below contains information regarding the differences in the approaches. However, each program-level biological opinion should contain at least the following:

1. Consultation History: Describe the history of activities that led the agencies to the development of the proposed action and the completion of biological opinion.

2. Description of the Proposed Action: Provide a detailed description of what is being proposed.

   A. If the specifics of the individual projects to be implemented under the action agency's program are known, this section should describe these projects in sufficient detail to allow complete effects and incidental take analyses to be developed. If sufficient information is provided regarding the future actions, additional project-level review is not needed; the program-level biological opinion will fulfill the action agency's consultation requirements and the program-level incidental take statement will provide the appropriate take exemptions (see "Batched Consultation Approach" section below).

   B. If at the time of programmatic consultation the specifics of the future projects to be implemented through the proposed program are not known in sufficient detail to determine the exact effects that are likely to result, this section should describe the proposed program (i.e., the standards, guidelines, and jointly developed assumptions) and the types of future actions that may result. The level of specificity for this portion of the document will vary depending on the level of detail provided by the action agency. Procedures for completing consultations on future actions

proposed under the program should also be identified (see "Tiered Consultation Approach" and "Appended Consultation Approach" sections below).

3. Status of the Species: Program-level biological opinions often address effects to numerous species. If there are many species, it may be appropriate to incorporate the species accounts as an appendix to the program-level opinion and simply summarize the information in the body of document.

4. Environmental Baseline: Again, if there are many species, it may be more appropriate to incorporate the specific environmental baselines for each species as an appendix, and include a discussion of the environmental baseline of the action area in more general terms in the main body of the opinion.

5. Effects of the Action: If sufficient information regarding the future individual projects is know, describe in detail the manner in which these actions will affect listed resources as in a standard biological opinion. If this level of detail regarding future actions is not known, evaluate the manner in which listed and proposed resources may be affected by individual future actions implemented in accordance with the standards or requirements of the action agency's program. This would include a discussion of the jointly developed assumption used to complete the effects analysis.

To complete the latter process, the Service should evaluate the likely effects to listed species and designated critical habitat from projects implemented in accordance with the standards or requirements of the action agency's program. A "conservative" effects analysis must be conducted; that is, the benefit of the doubt must be provided to the species and any effects that may result from future actions must be analyzed. Ultimately, the effects analysis must show that when the program standards are applied to each project, the net aggregate effects of all projects will not be reasonably likely to jeopardize the continued existence of a listed species or adverse modify designated critical habitat.

Thus, the effects analysis for programmatic biological opinions is completed on two levels. The first level evaluates the manner in which listed resources may be affected by the individual projects identified by the action agency, or, if specific projects are not identified, by individual projects designed and implemented in accordance with the standards or requirements of the action agency's program. The second level evaluates the potential landscape-level impacts to listed resources that may occur from implementing of all of the individual projects that may be developed under the proposed program. Again, if at the time of the program-level consultation individual projects are not sufficiently developed to

determine the specific effects that may result, the information provided by the action agency regarding the standards of the program is used to evaluate the full extent of impacts that may occur.

Thus, during the Services' analysis, the effects of all potential future actions that may be implemented under the program must be evaluated. For this reason it is essential that the action agencies and Services work together in pre-consultation to ensure that the agency's program contains sideboards that will provide the appropriate limits to potential future effects. If it is possible for an action to meet the standards of the program and result in certain effects, these potential effects must be analyzed. To handle this issue the action agency may specify limits on the impacts that are anticipated through implementation of the Federal program. These limits at times may be achieved through jointly limiting the project design, the period of time that the program-level biological opinion is in effect or the total amount of impacts allowed. For example, after five years of implementation or 300 acres of impact, there may be a requirement that the program-level consultation be reinitiated before continuing implementation. For additional information on this subject, see the "UNCERTAINTY" section above.

To ensure that the anticipated effects are not exceeded, the program-level biological opinion will identify procedures for monitoring the implementation of future projects and associated impacts. To accomplish this the effects section should contain an "Effects Tracking" subsection. This subsection should quantify the impacts, including incidental take, anticipated from implementation of the action agency's program. This quantification should use a set of metrics for that will be analyzed in each project-specific review document so the specific effects of all future projects can be tallied and compared to the total analyzed in the programmatic biological opinion. In this manner the Service and action agencies can ensure that the effects anticipated and analyzed in the program-level biological opinion are not exceeded during implementation of the future projects.

6. Cumulative Effects: Describe the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation. This section should be updated, as appropriate, whenever it is used to support activities implemented on the ground. For additional information on this, see the "Tiered Consultation Approach" and "Appended Consultation Approach" sections below.

7. Conclusions: Present the Services' opinion regarding whether the aggregate effects of the factors analyzed under "environmental baseline," "effects of the action," and "cumulative effects" in the action area - when viewed against the status of the species or critical habitat - are likely to jeopardize the continued

existence of the species or result in destruction or adverse modification of designated critical habitat.

8. Incidental Take Statement: While the primary purpose of conducting section 7 consultation is to insure the avoidance of jeopardy and adverse modification situations, a secondary purpose is to provide action agencies and their applicants with an exemption to the prohibitions of section 9 of the Act when appropriate. This is completed through the development of incidental take statements (ITS). Incidental take statements for programmatic biological opinions exempt the specific take anticipated to result from adoption of the "program" that is the subject of consultation. Based on the effects analysis, the programmatic incidental take statement should specify the maximum extent of incidental take that is anticipated through implementation of the action agency's program. This is a relatively straightforward process when the specific future projects to be implemented are described with sufficient detail to accurately anticipate the actual effects, and therefore, the specific incidental take, likely to result (i.e., when using the "batched consultation" approach to address the effects of multiple predetermined actions). Because the future proposed projects are known, the incidental take associated with them can be exempted and appropriate Reasonable and Prudent Measures, if any, along with associated Terms and Conditions that will minimize the impacts of the incidental take can be provided without the need for additional review.

   This issue is more complicated when addressing the effects of an action agency's "program." Because at this point in the consultation process it is likely that individual projects will not yet be developed, these incidental take statements are typically general in nature encompassing impacts from potential projects designed to fit within the program's standards, requirements, or criteria and they involve some form of future review and documentation. The manner in which they complete the future review and documentation will vary depending on the type of programmatic consultation process pursued (e.g., tiered or appended approaches). For information regarding incidental take statements for these types of consultation processes, see the "PROCEDURES FOR COMPLETING PROJECT-LEVEL CONSULTATION" section below and Appendix A.

Under the proposed amendment, the Secretary is required to specify the extent of incidental take that would not violate Section 7(a)(2) standard. The phrase "extent of take" is used to allow the Secretary flexibility in expressing the point at which incidental takings might result in a violation of Section 7(a)(2)... It is not intended that a quota necessarily be established, but rather that Federal agencies and permit or license applicants, if any, be provided with notice of the point at which incidental takings would result in a violation of Section 7(a)(2) of the Act. If the specified extent of take is exceeded, the Federal agency or permit or license applicant, if any, must immediately reinitiate consultation. (Senate Report No. 97-418, p.21)

9. Conservation Recommendations: identify discretionary actions the action agency can implement relevant to the proposed program and consistent with their section 7(a)(1) authority. These conservation recommendations serve several purposes. They can suggest how the action agency can assist species conservation in furtherance of their responsibilities under section 7(a)(1) of the Act. They may further minimize or avoid the adverse effects of future proposed projects on listed species or critical habitat. They may suggest ways to minimize or avoid the adverse effects of future proposed projects on proposed or candidate species. They may also recommend studies to improve the understanding of a species' biology or ecology, or of the effects of the action agency's activities.

10. Reinitiation - Closing Statement: Identify situations, if any, that meet one or all of the four reinitiation conditions. That is, (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, (3) the action is modified in a manner causing effects to listed species or critical habitat not previously considered, and (4) a new species is listed or critical habitat designated that may be affected by the action.

PROCEDURES FOR COMPLETING PROJECT-LEVEL CONSULTATION

In this section three procedures that are appropriate for carrying out program-level consultations will be discussed. These procedures are the batched, tiered, and appended consultation approaches. These approaches may be used individually, or at times, in combination with each other or other streamlining techniques.

Batched Consultation Approach

"Project batching" is an established technique that has been used effectively to streamline section 7 consultations for well over a decade. Batching can be used both within a standard section 7 consultation process where a single consultation document is generated to meet the consultation requirements for multiple proposed actions, or in combination with other programmatic consultation techniques to further streamline consultation. The batched consultation approach is appropriate when the action agency has proposed several projects that all have sufficient information to conduct a complete effects and incidental take analysis. In other words, the location, timing, and procedures to be used in each proposed project must be known so the Services can fully anticipate their specific effects, including the specific individuals that are likely to be incidentally taken. This level of detail for each project is necessary to use the batched consultation approach.[3] Under these circumstances the Services can "batch" these

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[3]Where this level of detail is lacking, the tiered or appended approaches may be used or appropriate assumptions may be jointly developed. However, careful consideration should be

multiple projects for evaluation within a single biological opinion or concurrence document. The procedures for completing batched consultation documents are the same as for completing standard consultation documents; however, depending on the number and complexity of the projects being batched, coordinating the evaluation of their effects can be challenging. To assist in addressing this issue it is recommended that effects tables be produced that identify the categories and extent of effects for each project. This can be a useful technique for assessing and totaling the effects of each project so the aggregate effects can be evaluated.

Tiered and Appended Consultation Approaches

Often action agencies need to consult on the effects of implementing a "program" prior to having specific projects sufficiently developed to conduct complete effects or incidental take analyses. For these types of consultations, either the tiered or appended approaches are more appropriate. Each involves the initial development of a program-level biological opinion that analyzes the potential effects of implementing the Federal agency's program, and then development of appropriate project-specific documentation that addresses the specific effects of each individual project that is proposed under the agency's program. With the tiered consultation approach, the Services complete a "project" biological opinion, including a project-specific incidental take statement, that tiers to the programmatic document. With the appended consultation approach, the Services produce project-specific documentation that is physically appended to the programmatic biological opinion and incidental take statement in an appendix. Note that while there is added predictability regarding the outcome of the project-level consultations due to the successful completion of the program-level consultation, it is still possible to reach a jeopardy or adverse modification determination due to changed conditions or unanticipated effects. However, the potential for such an outcome is extremely low. Following are procedures for implementing these approaches.

Tiered Consultation Approach

Tiered consultations follow what is often considered to be the "classic" programmatic consultation approach. Under the tiered programmatic consultation process, the project-level consultation requirements are completed using a project-level biological opinion as described below.

As individual projects (or batches of projects) are proposed under the program, the action agency provides project-specific information that describes each proposed action and the specific areas to be affected, identifies the species and critical habitat that may be affected, describes the anticipated effects, specifies, if appropriate, that the "anticipated effects from the proposed project are consistent with those anticipated and analyzed in the programmatic biological

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given to the use of assumptions due to the need to reinitiate consultation in the event that the assumptions fail, thus negating at least some of the benefits achieved from batching.

opinion," and describes additional effects, if any, not considered in the programmatic consultation.[4] The Service reviews this information for each proposed project and this project-specific review is appropriately documented in the project-specific or "lower-tier" consultation document as follows:

Concurrence. If it is determined that an individual proposed project is not likely to adversely affect listed species or designated critical habitat, the Service may complete its documentation with a standard concurrence letter that refers to the programmatic document (i.e., it "tiers" to it), and specifies that after reviewing the proposed project within the context of the action agency's program, the Service concurs that the proposed project is not likely to adversely affect listed species or designated critical habitat. It should be noted that in cases where the Service concurs that a "not likely to adversely affect" determination is appropriate, a standard "stand-alone" concurrence letter (i.e., one that does not "tier" to another document) may be used. However, tiering to a programmatic document may strengthen the Federal Government's administrative record.

Tiered Biological Opinions. If it is determined that the proposed project is likely to adversely affect listed species or designated critical habitat, even if the effects were considered in the program-level biological opinion, the Service completes a tiered biological opinion with a project-specific incidental take statement.[5] This document, while meeting the basic requirements of biological opinions as specified at 50 CFR 402.14(h), generally requires less effort to complete because it references back, or tiers, to the program-level biological opinion. When incorporating information by reference, the exact location (i.e., section name and page number) where the information can be found should be provided to minimize the level of effort the reader must expend to find the subject information. This process can result in project-level biological opinions being completed in as few as five or six pages. Project-level biological opinions should include at least the following elements:

(1) Introduction: Explain the relationship between the program-level and project-level biological opinions, and identify the information used to create each. This will generally include reference to the documents that were used to complete

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[4]For a discussion of the information to provide to initiate section 7 consultation, see 50 CFR 402.14(c). It may be appropriate for the action agency to reference, or tier to, the informational document(s) provided for the program-level (or "upper tier") consultation document.

[5]Note that it is not appropriate to provide a concurrence letter stating that the adverse effects of the proposed project were considered within the program-level consultation; a biological opinion is required for each action that is likely to result in adverse effects to listed species or designated critical habitat.

programmatic consultation as well as any other documents or information used to determine the effects of the proposed project.

(2) Project Description: Provide a short project summary. For example, "40 acres of suitable foraging habitat will be harvested from the panther watershed (township and range) of the Olivia ranger district using shelter wood harvest techniques that will leave 70 sq. ft. of basal area per acre. For a complete description of shelterwood harvest methods and restrictions employed by the ranger district in this timber harvest program, see the 'Shelterwood Harvest' section on page 12 of September 28, 2000, programmatic biological opinion (Service file number: 1-1-02-976)."

(3) Status of the Species and Environmental Baseline: Incorporate by reference the Status of the Species and Environmental Baseline sections from the programmatic biological opinion and an updated description of the environmental baseline incorporating effects that have occurred within the action area of the program (not simply the area affected by the specific project currently under review), since the last environmental baseline update. These effects include both those from other actions implemented under the action agency's program as well as actions unrelated to the program. In this manner each project-level biological opinion will essentially carry the updated environmental baseline for the action agency's program forward for use by subsequent project-level biological opinions.

(4) Effects Analysis. Include a detailed discussion of the effects of the proposed project on listed species and designated critical habitat. This will entail a summary of the effects of the proposed action and incorporation by reference of the pertinent portions of the effects analysis from the program-level biological opinion. Generally this section should specify what the proposed action will do to both individuals of the species that will be affected as well as the landscape, but it can refer back to the program-level biological opinion's discussion of these types of impacts and present any additional information on how the species and habitat will be affected by this specific project and how these impacts will affect the species' conservation. In general, the documentation presented in this step must be sufficient to show that the specific effects of the individual proposed project under review have been assessed. For example:

> "The proposed timber harvest is anticipated to result in the disruption of foraging activities of two individuals. [Provide a discussion of the specifics of the individuals to be impacted (e.g., past reproductive success if known, the role these individuals play in the species' conservation, etc.).] For a complete description of the manner in which

such disruptions of foraging activities impact this species, see the 'Timber Harvest' subsection of the 'Effects Analysis' section on page 7 of the June, 19, 2001, programmatic biological opinion."

This section should conclude with a statement regarding the consistency (or inconsistency) of the effects of the proposed project with the effects analyzed in the programmatic biological opinion.

(5) Updated Cumulative Effects Analysis: Cite the cumulative effects section in the program-level biological opinion and identify and analyze any additional cumulative effects for which information has been ascertained. Note that for this section of the project-level biological opinion, the action area of concern is that of the program, not simply the area affected by the specific proposed project under review. Therefore, each project-level biological opinion will essentially track the cumulative effects for the program. If at anytime it is determined that the total cumulative effects impacting the program's action area have increased to the extent that the effects to the listed resources have changed, the consultation at the program-level should be reinitiated.

(6) Conclusion. Provide the Service's opinion on whether the proposed project is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat. Note that it may be necessary to reinitiate consultation at the program-level if an individual project generated by the action agency's program results in a jeopardy or adverse modification determination, regardless of whether the action agency ultimately decides to implement the project. The fact that application of the program standards resulted in a proposed project that triggered a jeopardy or adverse modification determination indicates that the program has effects that the Services failed to properly anticipate during the program-level consultation.

(7) Incidental Take Statement: When using the tiered programmatic consultation approach, the Services develop a "tiered biological opinion" with an accompanying incidental take statement, if appropriate, for each individual project. Procedure for completing the incidental take statement are complicated by not having the future projects identified at the time of the program-level consultation. The complication in part comes from the nature of the section 7(a)(2) requirement that action agencies "insure" that their actions are not likely to jeopardize the continued existence of a listed species or adversely modify designated critical habitat. While section 7(a)(2) of the Act places an affirmative responsibility on the action agencies to adequately safeguard listed resources from the effects of their actions, under section 7(b)(4) the Services have an affirmative responsibility to identify the incidental take that is anticipated to occur from the

proposed action and then to develop RPMs and T&Cs for the action agency or their applicants to implement in order to minimize the potential impacts of the incidental take.

Because at the time of the program-level consultation the specific future projects that the action agency will implement are not yet developed, the specific effects that will result are not known with certainty. As previously stated, when such uncertainty exists the Services must provide the "benefit of the doubt" to the listed resources and complete what is sometimes known as a "worst case" effects analysis. While this procedure is appropriate for the effects analysis in order to ensure that the purposes of section 7(a)(2) of the Act are achieved, it is not appropriate for developing the incidental take statement. Once the effects analysis has been completed and "no-jeopardy" and "no-adverse modification" determinations are reached, then it is known that the worst effects, including any associated incidental take, the Services reasonably foresees will not violate section 7(a)(2). However, exactly which of these effects will occur is not yet known; hence, the need to conduct additional consultation when specific projects are developed. In some circumstances this would lead to the Services developing measures that are overly restrictive, thus needlessly burdening action agencies and their applicants with restrictive measures that are unnecessary. In other instances it may not be possible to develop meaningful conditions that will appropriately minimize the impacts of the specific take that results from future projects.

For these reasons, when developing incidental take statements for tiered program-level biological opinions, the Services will use the results of the effects analysis to identify the "maximum extent" of incidental take that may result from implementation of the action agency's program. This number can function as an indicator for action agencies to let them know when the additive effects resulting from their individual actions approach the limits of the Services' effects analysis. As this level of take is approached the action agency may need to reinitiate consultation with the Services to ensure that their activities are not disrupted due to unanticipated levels of impacts. However, because the exact incidental take that will occur is not known at the time of the program-level consultation, the Services cannot exempt it. The incidental take exemption will be provided in project-level biological opinions when the action agency can provide the specifics of their actions and the Services can identify the exact take that is likely to result and thus develop meaningful RPMs and T&Cs. The Services will develop standard language to handle this situation.

Because take is not exempted until the project-level consultation, final RPMs and T&Cs also are not developed until this time. However, at times it may be desirable for the Services to develop and identify at the program-level RPMs and T&Cs that they anticipate being included in project-level incidental take

statements. If this approach is taken, the Services may identify the circumstances under which such conditions would be incorporated or deemed unnecessary. This allows the action agency to plan for their implementation and, if desired, to incorporate them into their future project designs. The goal is to minimize the need for additional future conditions through the pre-consultation coordination and cooperation process. The program-level conditions would not become mandatory until the incidental take is actually exempted. Finally, in both program-level and project-level incidental take statements the Services should identify procedures for monitoring the impacts of the proposed incidental take. At times only some of the monitoring procedures identified in the program-level biological opinion may be appropriate for every proposed action. In these cases, the project-level biological opinion should specify which of the procedures is appropriate for the subject project. For language to use in tiered programmatic consultation incidental take statements, see Appendix A.

(8) Environmental Baseline Tracking: Provide a statement regarding the specific project's impacts to the environmental baseline (including a restatement of the amount of take that is anticipated) and a tallying of the overall impacts to the environmental baseline (including the overall amount of take) from all projects implemented under the programmatic consultation to date. The results of this section should be used to assist in creating the environmental baseline section for the next project-level biological opinion.

(9) Conservation Recommendations: Incorporate by reference any pertinent conservation recommendations from the program-level biological opinion and identify any additional conservation recommendations that are appropriate for the specific project under review.

Appended Consultation Approach

Unlike the tiered programmatic consultation approach, with the appended approach a single consultation document is generated. Then as individual projects (or batches of projects) are proposed, the action agency provides project-specific information that describes each proposed action and the specific areas to be affected, identifies the species and critical habitat that may be affected, describes the anticipated effects to listed species and critical habitat, specifies, if appropriate, that the anticipated effects from the proposed project are consistent with those anticipated in the program-level biological opinion, and describes any additional effects, if any, not considered in the programmatic consultation.[6] To initiate project-specific review, the action agency's project information and effects analysis should be accompanied by a cover letter

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[6]For a discussion of the information to provide to initiate section 7 consultation, see 50 CFR 402.14(c).

specifying that the action agency has determined that the proposed project is consistent with the program-level biological opinion and reasonable and prudent measures and associated terms and conditions, if any. This cover letter should also request that the proposed project be appended to the program-level biological opinion and associated incidental take statement, if appropriate, to fulfill the agency's consultation requirements. The Service then reviews the information and effects analysis provided for each proposed project, documents the results of this review in accordance with the guidance provided below, and physically attaches this documentation to the program-level biological opinion in an appendix.

Concurrence. In the case of projects that the Services concur are "not likely to adversely affect" listed resources, the Service may complete its documentation with a standard concurrence letter that refers to the program-level consultation document and specifies that the Service concurs that the proposed project is not likely to adversely affect listed species or designated critical habitat. This letter may either be delivered to the action agency as a stand-alone document, or it may be appended to the program-level document. Again, attaching this concurrence to a program-level document may strengthen the Federal Government's administrative record.

Appended Biological Opinion. If after review it is determined that an individual proposed project is "likely to adversely affect" listed resources, is consistent with the program-level biological opinion, and will not jeopardize the continued existence of listed species or adversely modify designated critical habitat, the Services develop a project-level review document (usually two to four pages). This document is then physically attached to the programmatic biological opinion in an appendix. Project-level review documents should contain the following elements:

(1) Introduction. Explain the relationship between the program-level biological opinion and the project-level review document and identify any additional information used to create the review document.

(2) Project Description. Provide a short project summary. For example, "40 acres of suitable foraging habitat will be harvested from the Heli watershed (township and range) of the Goude ranger district using shelter wood harvest techniques that will leave 70 sq. ft. of basal area per acre. For a complete description of shelterwood harvest methods and restrictions employed by the ranger district in this timber harvest program, see the 'Shelterwood Harvest' section on page 12 of the December 7, 2001, programmatic biological opinion (Service file number: 1-1-02-976).";

(3) Status of the Species and Environmental Baseline: Incorporate by reference the Status of the Species and Environmental Baseline sections from the programmatic biological opinion and provide an updated description of the environmental baseline incorporating effects that have occurred within the action area of the

program (not simply the area affected by the specific project currently under review) since the last environmental baseline update. These effects include both those from other actions implemented under the action agency's program as well as actions unrelated to the program. In this manner the documentation for each individual project will essentially carry the updated environmental baseline for the action agency's program forward for use in subsequent project-level reviews.

(4) Effects Analysis. Include a detailed discussion of the effects of the proposed project on listed species and designated critical habitat. This will entail a summary of the effects of the proposed action and incorporation by reference of the pertinent portions of the effects analysis from the program-level biological opinion. Generally this section should specify what the proposed action will do to both individuals of the species that will be affected as well as the landscape, but it can refer back to the program-level biological opinion's discussion of these types of impacts and present any additional information on how the species and habitat will be affected by this specific project and how these impacts will affect the species' conservation. In general, the documentation presented in this step must be sufficient to show that the specific effects of the individual proposed project under review have been assessed. For example:

> "The proposed timber harvest is anticipated to result in the disruption of foraging activities of two individuals. [Provide a discussion of the specifics of the individuals to be impacted (e.g., past reproductive success if known, the role these individuals play in the species' conservation, etc.).] For a complete description of the manner in which such disruptions of foraging activities impact this species, see the 'Timber Harvest' subsection of the 'Effects Analysis' section on page 7 of the December 7, 2001, programmatic biological opinion (Service file number: 3-6-03-33).."

This section should conclude with a statement regarding the consistency (or inconsistency) of the effects of the proposed project with the effects analyzed in the body of the program-level biological opinion.

(5) Updated Cumulative Effects Analysis: Cite the cumulative effects section in the program-level biological opinion and identify and analyze any additional cumulative effects for which information has been obtained. Note that for this section of the project-level documentation, the action area of concern is that of the program, not simply the area affected by the specific proposed project under review. Therefore, the documentation for each individual project will essentially

track the cumulative effects for the program. If at anytime it is determined that the total cumulative effects impacting the program's action area has increased to the extent that the effects to the listed resources have changed, the program-level consultation should be reinitiated.

(6) Conclusion: Provide the Service's opinion on whether the proposed project is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat. If a "no-jeopardy" or "no-adverse modification" determination is reached, then this section should include language that appends the proposed project to the program-level biological opinion. Note that it may be necessary to reinitiate consultation at the program-level if an individual project generated by the action agency's program results in a jeopardy or adverse modification determination, regardless of whether the action agency ultimately decides to implement the project. The fact that application of the program standards resulted in a proposed project that triggered a jeopardy or adverse modification determination indicates that the program has effects that the Services failed to properly anticipate during the program-level consultation.

(7) Incidental Take Statement: Incidental take statements for the Appended approach are generated during the development of the program-level biological opinion and are general in nature describing the manner in which take is anticipated and evaluating the maximum extent of incidental take that may occur given the sideboards established by the action agency's program design standards. This maximum extent of anticipated incidental take is derived from information presented in the program-level effects analysis. As individual projects are proposed and evaluated, they will be appended to the programmatic ITS as appropriate. This process is used because while the design standards will be established at the time of program-level consultation, the specifics of individual projects (e.g., precise locations, exact methods and procedures, etc.) will not. Thus, while it is possible to evaluate the estimated overall effects, including take, that may occur across the landscape from implementation of projects that meet the program standards, it may not be possible to develop the appropriate RPMs and T&Cs necessary to minimize the specific take that will occur with each proposed project because these are likely to be dependent on the attributes of the specific project, project area, and individuals affected.

If appropriate, the program-level incidental take statement will contain RPMs and T&Cs that can be implemented on a broad scale (i.e., the plan-level scale) and involve minor adjustments or additions to the design standards; however, the goal is to eliminate the need for these types of adjustments through the pre-consultation coordination and cooperation process. Program-level incidental take statements may also contain a series of RPMs and T&Cs that may be pertinent to some projects, but not to others, with direction that the appropriate measures and

conditions will be identified and applied during the project-level review. This will provide the action agencies with an idea of the measures that are likely to be required to minimize the impacts of the take associated with each individual project. As each project is reviewed, the Service will evaluate the need for each of the RPMs and T&Cs previously identified in the program-level ITS, or for any additional RPMs and T&Cs necessary to minimize the impacts of the anticipated take. The project specific documentation should identify these measures in a format similar to that used in the ITS of the program-level biological opinion so they can be clearly identified. Note that at times, no additional RPMs will be needed. In these cases, the Service's project-level documentation should state that no RPMs and T&Cs are necessary beyond those contained in the program-level incidental take statement.

While each program-level biological opinion will contain an ITS, as appropriate, its take exemption will not take effect until each specific project is appended to it. To accomplish this, the project-level documentation for each appended project should specify that the take anticipated from implementation of the appended project is a subset of that anticipated in the program-level incidental take statement. For example:

> "Implementation of the proposed project is anticipated to result in the incidental take of two individuals associated with 38 of the 300 acres of habitat anticipated to be removed under the [action agency's] construction program that was analyzed in the October 28th, 2002, program-level consultation (Service file number: 2-3-01-76)."

In this way the programmatic ITS is essentially a "vessel" that is filled by the incidental take associated with the various projects as they are appended to the program-level biological opinion. When sufficient projects have been appended to the programmatic consultation to account for all the incidental take anticipated by the program-level ITS (i.e., when the "vessel" is full), no additional projects should be added without modification; any new projects proposed to be appended to the programmatic document would require reinitiation of consultation to determine whether coverage is appropriate (note that there are similar requirements for project effects; that is, when sufficient projects have been appended to the programmatic consultation to account for the effects anticipated by the program-level biological opinion, activities must stop and consultation should be reinitiated and, if appropriate, the biological opinion must be updated before additional projects may be appended to it). It is imperative that the

cumulative amount of incidental take exempted by the program-level ITS be appropriately tracked. For appropriate language to use in appended programmatic consultation incidental take statements, see Appendix A.

(8) Environmental Baseline Tracking and Conclusions: Provide a statement regarding the specific project's impacts to the environmental baseline (including a restatement of the amount of take that is anticipated) and a tallying of the overall impacts to the environmental baseline (including the overall amount of take) from all projects appended to the program-level biologic opinion and associated ITS to date. If the project is found to be consistent with the effects evaluated in the program-level biological opinion and will not exceed the total effects or incidental take anticipated in that biological opinion, state that the project is hereby appended to the program-level biological opinion and associated incidental take statement. The results contained in this section should be used to assist in creating the environmental baseline section for the next project-level review.

PROGRAMMATIC CONSULTATION MONITORING AND REVIEW

In addition to the monitoring associated with the confirmation of assumptions used in the effects analysis and the reporting requirements contained in the ITS, a comprehensive review of how the program-level biological opinion is working and whether its implementing procedures are being complied with should be conducted at least annually. During this review the environmental baseline should be reviewed and updated as needed to account for unanticipated effects or the lack of anticipated effects. In addition, the additive effects that resulted from the individual projects should be evaluated to ensure that the program-level biological opinion effects analysis is accurate. During this process it may be determined that the program-level biological opinion is functioning as anticipated and, therefore, activities should continue, or that adjustments should be made. Although this comprehensive review should be conducted at least annually, the program-level consultation should be reinitiated if at any time during implementation of activities it is determined that: (1) the amount or extent of incidental take exempted by the program-level biological opinion is exceeded; (2) new information reveals effects of the actions that may affect listed resources in a manner or to an extent not considered in the program-level biological opinion; (3) the action agency's activities are subsequently modified in a manner or to an extent that causes effects to listed resources that were not considered in the program-level biological opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action.

CONCLUSION

This guidance document contains several appropriate methods for completing programmatic consultation. Each approach may not be appropriate for every situation. The appropriate approach will depend on the specifics of each situation (e.g., the level of project specific information available at the time of consultation, workload and staffing issues, etc.). The

Services should consider these factors along with the desires of the action agency when determining the appropriate approach for each individual situation. However, the ultimate decision as to the appropriate consultation approach for any given situation remains with the Services.

Appendix A

This appendix will contain Incidental Take Statement language.

ATTACHMENT B

REQUEST TO APPEND AN ACTION TO THE PROGRAMMATIC BIOLOGICAL OPINION FOR SLOAN CANYON RESOURCE MANAGEMENT PLAN, CLARK COUNTY, NEVADA FILE NO. 1-5-06-F-416

Name of Action:

Requested by: Date:
Title:
Agency/Office
Phone No.

Species Affected:

Critical Habitat Affected: Yes ❑ No ❑

I. Description of Action and Action Area (include map)

A. Description of fire and suppression activities:

B. Habitat quality/suitability:

II. Measures Implemented to Minimize the Effects of the Proposed Action (may refer to specific terms and conditions in the Incidental Take Statement of the programmatic biological opinion):

A. Were these measures effective?

B. Recommendations for future programmatic actions:

III. Effects of Proposed Action on the Listed Species

A. No. of acres and plant communities disturbed:

B. Description of affected individuals of listed species:

C. Assessment of habitat rehabilitation recommended:

D. Are there additional effects of the action not considered in the programmatic biological opinion? If so, describe.

Attachment C

SECTION 7 FEE PAYMENT FORM

Entire form is to be completed by Federal agency and project proponent

Biological Opinion File Number: 1-5-06-F-416 (Appended action no.: APD ___)

Species: Desert tortoise (*Gopherus agassizii*)

Location of Fish and Wildlife Service Office that Issued the Opinion: Reno, Nevada

Project: _____

Amount of Payment Received: _____

Total Payment Required: _____

Date of Receipt: _____

Check or Money Order Number: _____

Number of Acres to be Disturbed: _____

Project Proponent: _____

Address: _____

_____

Telephone Number: _____

Authorizing Agency: Bureau of Land Management
4701 N. Torrey Pines Drive
Las Vegas, Nevada 89130

BLM Case Number: _____

Project Reviewed By: _____
Wildlife Staff

Make checks payable to: Clark County Treasurer

Deliver check to: Clark County Habitat Conservation
Department of Air Quality and Environmental Management
Post Office Box 558270
Las Vegas, Nevada 89155
(702) 455-3530

If you have questions call the Las Vegas Office of the U.S. Fish and Wildlife, Monday through Friday 7:30-4:30 PM, at (702) 515-5230.